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Map
of the
WEST OF CORNWALL
to illustrate Dr. FORBES's Paper on the
MEDICAL TOPOGRAPHY
of the
LANDS-END
District.

From Dr. Boase's Geol. Map.

ATLANTIC OCEAN

Trevaunance Cove
Piran Bay
Perranarabuloe
St. Agnes Hd.
St. Agnes
Porth Towan
Portreath
Kenwyn
Truro
Kea
Redruth
St. Day
Godrevy Island
Gwithian
Camborne
St. IVES
St. IVES BAY
Phillack
Gwennap
Perran Arworthal
Feock
Stithian
Gurnards Hd.
Zennor
Leland Uny.
Towednack
Carnmear
Polmear Cove
Pendeen Cove
Marnah
St. Ives
HUNDRED OF PENWITH
HUNDRED
Penryn
Glurias
Mylor
Falmouth
Budock
Maybe
Wendron
Ludgvan
Gulval
Madron
Botallach
Cape Cornwall
St. Just
Penzance
St. Hilary
Marazion
St. Michaels Mount
Perranuthnoe
Germoe
Sithney
St. Breage
Cuddan Pt.
Constantine
Helston
HUNDRED OF
Mawnan
Rosemullion Hd.
Helford R.
Anthony
Manaccan
Nare Head
White Sand Bay
St. Paul
St. Buryan
LANDS END
Sennen
Porthleven
Looe Pool
Mawgan
St. Martin
Dranna Pt.
Porthoustock
Lamorna Cove
St. Levan
Tol Pedan Penwith
Logan Rock
Gunwalloe
Cury
St. Keverne
KERRIER
Wrea Point
Bolerium
Mullion
Mullion Id.
Ruan Major
Ruan Minor
Grade
Black Hd.
Vellan Pt.
Kinance Cove
LIZARD POINT
Landewednack
Kennick Cove
FALMOUTH HARBOUR.

References to the Geological Divisions
- Granite Rocks
- Killas or Slaty Rocks (Phorphyritic series)
- Killas or Slaty Rocks (Calcareous series)
- Killas or Slaty Rocks (Magnesian or Serpentine series)

Statute Miles
0 1 2 3 4 5 6

5° Longitude W. from Greenwich.

Trans of Provincial Assoc. Vol. II. P. 32.

London. — A. Ducotés Litho. 70 St. Martins Lane

THE

TRANSACTIONS

OF THE

PROVINCIAL

MEDICAL AND SURGICAL

ASSOCIATION.

INSTITUTED 1832.

VOLUME II.

LONDON:
SHERWOOD, GILBERT, AND PIPER;
AND
DEIGHTON, WORCESTER.

MDCCCXXXIV.

WORCESTER: PRINTED BY H. B. TYMBS AND H. DEIGHTON,
JOURNAL OFFICE.

CONTENTS.

PAGE.

List of Officers and Members, ... v

Proceedings at the Anniversary, ... xxiii

Part I.

ARTICLE.

I.—An Address delivered at the First Anniversary of the Association. By Edward Barlow, M. D. Physician to the Bath United Hospital, &c. 1

Part II. Medical Topography.

II.—Sketch of the Medical Topography of the Hundred of Penwith, comprising the district of the Landsend, Cornwall. By John Forbes, M. D., F. R. S. Physician to the Chichester Infirmary, &c. *With a Map.* 32

III.—Medical Topography of Bristol. By Andrew Carrick, M. D. Senior Physician to the Bristol Infirmary; and John Addington Symonds, M. D. Physician to the Bristol General Hospital, and Lecturer on Forensic Medicine, 148

IV.—Topographical Account of Stourport, Worcestershire, and its immediate neighbourhood. By Kenrick Watson, Esq. Surgeon, ... 181

Part III. Essays and Cases.

V.—Additional Facts and Observations on the Efficacy of Strychnia in some forms of Paralysis. By James Lomax Bardsley, M. D. Physician to the Manchester Royal Infirmary, &c. 200

VI.—Observations on the Treatment of Syphilis without Mercury. By Thomas Green, M. D. Bristol, ... 241

VII.—Observations on Chronic Peritoneal Inflammation and its Treatment, with Cases. By Edward Thompson, Esq. Whitehaven, Member of the Royal College of Surgeons, 268

VIII.—History of a Case of Lithotomy by the Rectum. By James Dawson, Esq. Surgeon to the Liverpool Infirmary, 301

IX.—Case of Hydrophobia. By Ralph Barnes Grindrod, Esq. Surgeon Manchester. *With a Plate.* 311

X.—On the Variations in the Production of Certain Diseases not usually supposed subject to Epidemic Influence. By J. Brown, M. D. Physician to the Sunderland an Bishopwearmouth Infirmary, ... 329

ARTICLE. PAGE.

XI.—A Case of Tuberculous Affection of the Right Kidney, with extensive disease of the Spinal Column, preceded by the expulsion of a Biliary Concretion. By John Prichard, Esq. Surgeon, Leamington, ... 340

XII.—A Case of Uterine Hydatids. By William Daniel Watson, Esq. Surgeon, Warwick. *With a Plate.* 349

XIII.—Singular Case of a Foreign Body found in the Heart of a Boy. By Thomas Davis, Esq. Surgeon, Upton-upon-Severn. *With a Plate.* 357

XIV.—On Dislocation of the Shoulder. By W. F. Morgan, Esq. late House Surgeon to the Bristol Infirmary, ... 361

XV.—A Description of the Anatomical Structure of the Liver of a Rat, from Cuba. By Henry Riley, M. D. Senior Physician to St. Peter's Hospital, Bristol. *With a Plate.* 364

XVI.—Observations upon Cholera, as it appeared in Wolverhampton and its Neighbourhood, in August, September, and October, 1832. By T. Ogier Ward; M. B. Physician to the Dispensaries of Wolverhampton and Lichfield, 368

XVII.—Some Observations on the Peculiarities of Diseases of Infants and Children. By J. K. Walker, M. D. Senior Physician to the Huddersfield Infirmary, ... 391

XVIII.—Some Observations on the Influence of Sleep on the Vital Functions. By Roger Wakefield Scott, M. D. Physician to the Liverpool South Dispensary, ... 423

Part IV. Medical Jurisprudence.

XIX.—An Attempt to ascertain, by experiment, the exact differences between the changes produced in the Lungs of still-born Children, by their artificial inflation, and those produced in the Lungs of new-born Children, by natural respiration. By Egerton A. Jennings, Esq. F. L. S. Surgeon to the Leamington Charitable Bathing Institution, 435

Part V. Reports of Infirmaries.

XX.—Report of the Birmingham Infirmary for Diseases of the Eye, from Jan. 1 to Dec. 31, 1833. By Richard Middlemore, Esq. Assistant Surgeon to the Eye Infirmary, &c. 457

XXI.—A Report of the Out-Cases attended by George Parsons, Esq. at the Birmingham Infirmary, from Jan. 1 to Dec. 31, 1833, ... 474

Part VI. Biography.

XXII.—Biographical Memoir of the late Dr. John Darwall, of Birmingham. By John Conolly, M. D. of Warwick,... 489

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R. Jones, Esq. Surgeon to the Leamington Hospital and Charitable Bathing Institution.
Robert Jones, Esq. Surgeon, Strefford, Salop.
W. G. Jotham, Esq. Surgeon to the Dispensary, Kidderminster.
Richard Jukes, Esq. Surgeon, Stourport.
A. Jukes, Esq. Surgeon to the Birmingham General Hospital.

Wm. Kaye, M. D. Cheltenham.
Joseph J. Kelson, Esq. Surgeon, Bristol.
I. A. M. E. S. Kennedy, M. D. Ashby-de-la-Zouch.

George Kenrick, Esq. Surgeon, Melksham.
Wm. Kerr, M. D. Physician to the Northampton Infirmary.
J. Kidd, M. D., F. R. S. Regius Professor of Physic in the University of Oxford.
John Kilvert, Esq. Surgeon, Bath.
John King, Esq. Surgeon, Clifton, Bristol.
George James Knapp, Esq. Surgeon, Bath.
J. Arnold Knight, M. D. Physician to the Infirmary, Sheffield.

Joseph G. Lansdowne, Esq. Surgeon to the New General Hospital, Bristol.
Robert Lax, Esq. Surgeon, Bristol.
John Latham, Esq. Surgeon, Wavertree, near Liverpool.
Wm. Lang, Esq. House Surgeon to the New General Hospital, Bristol.
Arthur Sealy Lawrence, Esq. Surgeon, Potishead, Somersetshire.
Walter Leach, Esq. Surgeon, Chilcompton, Somersetshire.
Paul Leman, Esq. Surgeon, Sodbury, Gloucestershire.
Frederick Leman, Esq. House Surgeon to the Infirmary, Bristol.
Isaac Leonard, Esq. Surgeon, Bristol.
James Lewis, Esq. Surgeon, Hanley, near Upton-on-Severn.
George Lewis, Esq. Surgeon to the Wrexham Self-supporting Dispensary.
Thomas Lingen, Esq. Surgeon, Stourport.
Charles Loudon, M. D. Leamington.
Septimus S. Lowe, Esq. Surgeon, Stratford-on-Avon.
Thomas Lloyd, M. D. Physician to the Dispensary, Ludlow.
William. Lloyd, Esq. Surgeon, Birmingham.
George Lloyd, M. D. Shiffnal.
Peter Francis Luard, M. D. Physician to the Warwick Dispensary, Licentiate of the College of Physicians, London.
Thomas Lukis, Esq. Surgeon, Kidderminster.
Gilbert Lyon, M. D. Physician to St. Peter's Hospital, Bristol.
G. H. Lyford, Esq. Surgeon to the Winchester Hospital.

James Mc Cabe, M. D. Physician to the Dispensary and Casualty Hospital, Cheltenham.
G. A. Macauley, Esq. Surgeon, Knighton, Radnorshire.

Joseph Mc Coragher, M. D. Physician to the Infirmary, Chichester.
Robert Poyntz Mc Donald, Esq. Surgeon, Yatton, Somerset.
—— Macrorie, M. D. Physician to the Workhouse and Fever Hospital, Liverpool.
Jonas Malden, M. D. Senior Physician to the Worcester Infirmary.
Robert Mann, Esq. Surgeon, Manchester.
George Mantell, Esq. Surgeon, Farringdon, Berkshire.
Philip Marshall, Esq. Surgeon, Shepton Mallet, Somersetshire.
John Marshall, Esq. Surgeon, Tetbury, Gloucestershire.
Peter Martin, Esq. Surgeon, Reigate, Surry.
James Mash, Esq. House Surgeon to the Northampton Infirmary.
William Bakewell Matthews, Esq. Surgeon, Atherstone.
William Maurice, Esq. Surgeon, Bristol.
Charles Mayberry, Esq. Surgeon, Cheltenham.
Edward T. Meredith, Esq. Surgeon, Presteign.
Richard Middlemore, Esq. Assistant Surgeon to the Birmingham Eye Infirmary.
Amos Middleton, M. D. Leamington.
William Middleton, Esq. Senior Surgeon to the Leamington Hospital.
Samuel Miller, Esq. M. D. Physician to the Chelmsford Dispensary.
William F. Morgan, Esq. House Surgeon and Apothecary to the Bristol Infirmary.
William Mortimer, Esq. Surgeon, Clifton, Bristol.
Henry Moreton, Esq. Surgeon, Sodbury, Gloucestershire.
Edward Morris, Esq. Surgeon to the Dispensary, Worcester.
Joseph W. Moss, M. B. Oxon, F. R. S. L. Dudley.
G. Robert Moyer, Esq. Surgeon, Bath.
Charles Mules, Esq. Surgeon, Ilminster, Somerset.
S. H. Murley, Esq. Surgeon, Cheltenham.

—— Nankivel, Esq. Surgeon, Coventry.
James Nash, M. D. Physician to the Worcester Infirmary.
—— Newman, Esq. Surgeon, Corsham, Wilts.
George Norman, Esq. Surgeon to the Bath United Hospital.
John North, Esq. Surgeon Apothecary to the Brecon Infirmary.

John Ormond, Esq. Surgeon, Bath.
Henry Ormond, Esq. Surgeon, Wantage.

—— Parsley, Esq. Surgeon, Worle, Somersetshire.
George Parsons, Esq. Surgeon, Birmingham.
Samuel Partridge, Esq. Surgeon, Birmingham.
Henry Perry, Esq. Surgeon, Henbury, near Bristol.
George Peskett, Esq. Surgeon, Funtington, near Chichester.
Thomas Phinn, Esq. Surgeon, Bath.
Matthew Pierpoint, Esq. Surgeon to the Worcester Infirmary.
John Piper, Esq. Surgeon, Birmingham.
Charles Pope, Esq. Surgeon, Temple Cloud, Somersetshire.
Thomas Pope, Esq. Surgeon, Cleobury Mortimer.
William Ogilvie Porter, M. D. Bristol.
—— Porter, Esq. Surgeon, Birmingham.
Richard Powell, Esq. Surgeon, Bristol.
Henry Prince, Esq. Resident Apothecary, Bath Hospital.
T. B. Proctor, Esq. Surgeon, Leintwardine.
William Prosser, Esq. Surgeon, Monmouth.
John Freer Proud, Esq. Surgeon to the General Dispensary, Wolverhampton.
James Prowse, Esq. Surgeon, Bristol.
James Cowles Prichard, M. D., F. R. S. Bristol; Physician to the Bristol Infirmary.
John Pritchard, Esq. Surgeon, Leamington.
James Pritchard, Esq. Surgeon, Stratford-on-Avon.
Thomas Pritchard, Esq. Surgeon, Kington, Herefordshire.

Thomas Radford, Esq. Surgeon Extraordinary to the Manchester Lying-in Charity.
John A. Ransome, Esq. Senior Surgeon, to the Manchester Royal Infirmary, and Lecturer on the Principles and Practice of Surgery.
John Rayment, Esq. Worcester.
—— Reynolds, M. D. Liverpool.
David Rice, Esq. Surgeon, Stratford-on-Avon.
W. H. Ricketts, Esq. Surgeon, Droitwich.
Martin Ricketts, Esq. Surgeon, Droitwich.
Henry Riley, M. D. Bristol; Senior Physician to St. Peter's Hospital, and Lecturer on Anatomy.
Archibald Robertson, M.D. Physician to the Northampton Infirmary.
Thomas Roblyn, Esq. Senior Surgeon to the Clifton Dispensary, Hotwells, Bristol.

George Rootes, Esq. Surgeon, Ross.
James Wyke Rowland, Esq. Surgeon to the Iron Bridge Dispensary.
Christopher Royston, Esq. Surgeon, Redditch, Worcestershire.
J. Rumsey, M. D. Amersham, Bucks.
Nathaniel Rumsey, Esq. Surgeon, Beaconsfield.
John Rutter, M. D. Liverpool.
Frederick Ryland, Esq. Surgeon, Birmingham.

William Sainsbury, M. D. Corsham, Wiltshire.
Edward Salmon, Esq. Surgeon, Thornbury, Gloucestershire.
—— Sanders, Esq. Surgeon, Birmingham.
Roger Scott, M. D. Physician to the South Dispensary, Liverpool.
Charles Seager, Esq. Surgeon, Cheltenham.
Wm. Frowd Seagram, Esq. Surgeon, Warminster.
Frederick Seagram, Esq. Surgeon, Warminster.
Hungerford Sealy, M. D. Bath.
Congreve Selwyn, Esq. Surgeon, Ledbury.
Edmund Seward, Esq. Surgeon to the Bromyard Dispensary.
John B. Shelton, Esq. Surgeon, Bromyard.
James P. Sheppard, Esq. Senior Surgeon to the Worcester Infirmary.
Richard Short, Esq. Surgeon, Solihull, Warwickshire.
John Sims, M. D. London; Physician to the Mary-le-bone Infirmary.
Charles Phillett Slater, Esq. Surgeon, Bath.
Charles Smerdon, Esq. Surgeon, Clifton, Bristol.
Richard Smith, Esq. Bristol; Senior Surgeon to the Bristol Infirmary.
Nathaniel Smith, Esq. Bristol; Surgeon to the Bristol Infirmary.
Thomas Smith, Esq. Surgeon, Evesham.
Henry L. Smith, Esq. Surgeon, Southam.
Thomas Smith, Esq. Surgeon, Stroud, Gloucestershire.
John Smith Soden, Esq. Surgeon to the Bath United Hospital, to the Bath Eye Infirmary, and to the Bath Penitentiary.
J. C. Spender, Esq. Bath, Lecturer on Anatomy.
E. A. Spilsbury, Esq. Surgeon, Walsall.
George Spry, Esq. Surgeon, Bath.
William Squires, M. D. Liverpool.
Hugh Standert, Esq. Taunton; late Surgeon to the Taunton and Somerset Hospital.

Thomas Steel, Esq. Surgeon, Abergavenny.
William Steel, Esq. Surgeon, Abergavenny.
Thomas Stephenson, Esq. Surgeon, Worcester.
John B. Steward, M. D. Fellow of the College of Physicians, Lunatic Asylum, Droitwich.
Robert I. N. Streeten, M. D. Physician to the Worcester Dispensary.
Thomas Stockwell, Esq. Surgeon, Bath.
Charles Starkey, Esq. Surgeon, West Bromwich, Staffordshire.
Richard Strong, Esq. Surgeon, North Petherton, Somersetshire.
—— Sully, M. D. Oakhills, near Taunton, Somersetshire.
B. C. Sully, M. D. Cheltenham.
T. L. Surrage, Esq. Surgeon, Bristol.
John C. Swayne, Esq. Surgeon, Bristol.
G. Swinson, Esq. Surgeon, Birmingham.
J. A. Symonds, M. D. Physician to the General Hospital, Bristol.

G. Taylor, Esq. Surgeon, Birmingham.
William Terry, Esq. Surgeon to the Northampton Infirmary.
William Thackeray, M. D. Chester.
Frederick Thackeray, M. D. Cambridge.
Joseph Thomas, Esq. Worcester; Deputy Inspector of Hospitals.
Charles Thompson, Esq. Surgeon, Ross.
Thomas Thomson, M. D. Physician to the Stratford Dispensary.
Edward Thompson, Esq. Surgeon to the Whitehaven Infirmary.
Sir C. Throckmorton, Bart. M. D. Coughton, Warwickshire.
Thomas Thursfield, Esq. Surgeon to the Dispensary, Kidderminster.
William Thursfield, Esq. Surgeon, Bridgnorth.
Richard Thursfield, Esq. Surgeon to the United Dispensary, Broseley.
G. F. Todderick, M. D. Bath; Hon. Fellow of King and Queen's College in Ireland.
T. J. Todd, M. D. Physician to the Dispensary, Brighton.
Jonathan Toogood, Esq. Senior Surgeon to the Bridgewater Infirmary.
Harry Tracey, Esq. Surgeon, Plymouth.
William Trevor, Esq. Surgeon, Bridgewater.
William Tuckwell, Esq. Surgeon to the Oxford Infirmary.
William Tudor, Esq. Surgeon to the Bath Hospital.
N. Tudor, Esq. Surgeon, Leintwardine.
William Key Tunnicliff, Esq. Surgeon, Tewkesbury.

Thomas Turner, Esq. Surgeon to the Manchester Royal Infirmary, and Lecturer on Anatomy and Surgery.

Charles Underwood, M. D. Ross.

George Waldron, Esq. Surgeon, Bath.
J. K. Walker, M. D. Physician to the Huddersfield Infirmary.
George Wallis, M. D. Bristol; Physician to the Bristol Infirmary, and Lecturer on Anatomy.
Thomas Ogier Ward, M. B. Oxon; Physician to the Wolverhampton Dispensary.
Henry Ward, Esq. Surgeon, Ross.
John Ware, Esq. Oculist, Clifton, Bristol.
Kenrick Watson, Esq. Surgeon, Stourport.
William D. Watson, Esq. Surgeon, Warwick.
Charles Webb, Esq. Surgeon, Oxford.
John Webb, Esq. Surgeon, Alcester.
Edward Welchman, Esq. Surgeon, Kineton, Warwickshire.
George Wells, Esq. Surgeon, Halford Bridge.
A. Wheeler, Esq. Surgeon, Worcester.
James Whicher, Esq. Surgeon, Petersfield.
Joseph Wickenden, Esq. Surgeon, Birmingham.
John C. Wickham, Esq. Surgeon, Didmarton, Gloucestershire.
W. I. Wickham, Esq. Surgeon to the Winchester Hospital.
—— Wild, Esq. Surgeon, Stourport.
James Williams, Esq. Martin, near Worcester.
John Williams, Esq. Surgeon, Bewdley.
Owen W. Williams, Esq. Surgeon, Leamington.
—— Williams, Esq. Surgeon, South Brent, Somersetshire.
David Williams, M.D. Physician to the North Dispensary, Liverpool.
Peter Williams, Esq. Holywell, Surgeon to the Flintshire General Dispensary.
Richard Lloyd Williams, Esq. Surgeon to the Denbighshire General Dispensary and Asylum for the Recovery of Health.
John Calthorp Williams, M. D. Lecturer on Medicine in the Medical School, Nottingham.
Edm. W. Wilmore, Esq. Surgeon to the Dispensary, Worcester.
John Grant Wilson, Esq. Surgeon to the General Hospital, Bristol.

James W. Wilson, Esq. Surgeon to the Manchester Royal Infirmary, &c.
George Wilson, Esq. Surgeon, Monmouth.
William Winter, Esq. Surgeon, Bristol.
George Witt, M. D. Physician to the General Infirmary, Bedford.
George Leighton Wood, Esq. Surgeon, Bath.
Miles Astman Wood, Esq. Surgeon to the Dispensary, Ledbury.
Abraham Wood, Esq. Surgeon, Rochdale.
—— Wood, Esq. Surgeon, Birmingham.
J. Woodforde, M. D. Wells.
James Woodman, M. D. Bath.
William Woodward, Esq. Surgeon, Pershore.
John Wootton, M. D. Physician to the Infirmary, Oxford.
Samuel Wolstenholme, Esq. Surgeon to the Holywell Dispensary, Flintshire.
George Wolstenholme, Esq. Surgeon, Bolton, Lancashire.
Edward W. Wright, M. D. Shipston-on-Stour.
Thomas Wynter, Esq. Surgeon, West Bromwich.

J. C. Yeatman, Esq. Surgeon, Froome, Somersetshire.
James Yonge, M. D. Plymouth ; Fellow of the Royal College of Physicians.

As it is scarcely possible to avoid errors in printing so numerous a list of Members, the Secretaries are anxious, wherever they are committed, that they may be amended ; and will, therefore, feel obliged, if those Members, whose names are not rightly inserted, or whose Christian names are omitted, will send a notification to them, free of postage.

PROCEEDINGS

AT THE

FIRST ANNIVERSARY MEETING

OF THE

PROVINCIAL

MEDICAL AND SURGICAL ASSOCIATION,

AT THE

BRISTOL INFIRMARY.

At eleven o'clock in the morning of July 19, 1833, the Members of the Council met in the Infirmary Committee-room, to arrange such preliminary business as was necessary; and at one o'clock, by which hour nearly 200 Members had arrived, the Public Meeting commenced, when Dr. Carrick, of Clifton, was unanimously called upon to preside. Amongst other Members at this time in the room, were,

Mr. Alexander, ... Corsham.
— Alford, ... Taunton.
Dr. Barlow, ... Bath.
— Baron, ... Cheltenham.
Mr. Batt, ... Abergavenny.
— Beddome, ... Romsey, Hants.
Dr. Bevan, ... Monmouth.
Mr. Bisdee, ... Weston.
Dr. Blackmore, ... Bath.
Mr. Bleeck, ... Bristol.
Dr. Bompass, ... Fishponds.
Mr. Brewer, ... Newport, Wales.
— Browne, ... Cheltenham.
Dr. Burridge, ... Barnstaple.
Mr. Burroughs, ... Bristol.
— G. Bird, ... Swansea.
— Carden, ... Worcester.
— Carden, ... Gloucester.
Dr. Carrick, ... Bristol.
Mr. Church, ... Bath.
— Cleave, ... Bristol.
— Collins, ... Chew Magna.
— Colthurst, ... Bristol.
Dr. Conolly, ... Warwick.
— Conolly, ... Cheltenham.
Mr. Crang, ... Hallatrow.
— Crawford, ... Shrewsbury.
— Day, ... Bristol.
Dr. Davies, ... Ditto.
— Paris Dick, ... Castle Cary.
Mr. Eastment, ... Wincanton.
— Edwards, ... Wiveliscombe.
— Edwards, ... Keynsham.
— Evans, ... Chepstow.
— Falls, ... Bristol.
— Fewster, ... Thornbury.
Dr. Feild, ... Worcester.
Mr. Flower, ... Chilcompton.
Dr. Forbes, ... Chichester.
— Fox, ... Bristol.
Mr. Fox, ... Cerne, Dorset.
— Gee, ... Bristol.
— George, ... Bath.
Dr. Gingell, ... Thornbury.
Mr. Gill, ... Wolverhampton.
— Golborne, ... Chippenham.

Members might be directed, are—1st. From each of the Countries before mentioned, the Members might procure, if deemed advisable, the best Periodical Medical Publications, or Transactions of Scientific Bodies; they should also arrange to correspond with a Physician or Surgeon of eminence in each country. Such Foreign correspondents to be appointed Honorary Members, and to have our Transactions sent to them. Their business would be to note discoveries or questions in agitation, new works appearing, and experiments in progress, in their respective countries. 2ndly. The constitution of the Medical Bodies in the different countries, and their effects should be carefully collected, and the Medical Topography and Statistics of each country attended to.

"The Council have also taken into their consideration the propriety of establishing an Annual Prize Essay on some Medical or Surgical subject. They feel that at present they should not be justified in recommending any part of the Balance which is now in the Treasurer's hands, being applied to that purpose, but they cannot help calling the attention of the Members to the liberal proposition of Dr. Thackeray, of Chester, who transmitted five ponnds to the Secretaries, and in a letter to them which accompanied this donation, he states, "If nineteen other individuals would subscribe twenty pounds each, and place the money in some public security, I would add fifteen more to the sum I have transmitted. The interest of the £400 might be given annually for the best Essay on some Medical or Surgical subject."

"The Council are not aware that it is necessary for them to propose any alteration in the Constitution of the Association as agreed upon last year at Worcester; they, however, think it desirable that some Honorary Members be added to our list; they have already recommended that the correspondents who may reside in Foreign Countries, shall be considered Honorary Members; and they beg, also, to propose that, as one of our Members, Dr. Traill, of Liverpool, has been removed from the provinces to an elevated situation in the University of Edinburgh, he also be considered an Honorary Member. The Council also beg further to recommend, that every annual President of the Association, at the expiration of the year of his Presidency, be appointed a Permanent Vice-President.

"The Council cannot conclude their Report, without reminding the Members generally of the important duties which devolve upon them when they join the Association: it is manifest that the aggre-

gate amount of information which we may be the means of communicating to the public, must arise from the combination of individual efforts. It is therefore not too much to expect that every Member will, as far as his opportunities will admit, avail himself of the peculiar advantages afforded by the Association, and thus extend the boundaries of Medical Science.

"CHAS. HASTINGS, } Secretaries to the
"J. P. SHEPPARD, } Association."

The following resolutions were then carried unanimously :—

That the Report of the Council now read, be approved and adopted.

That the thanks of this meeting be given to Dr. Barlow, for his excellent Address, and that the same be printed and circulated separately, with the Report of the Council ; and also form the introductory article to the next Volume of the Transactions.

That the Anniversary Meeting for 1834, be held at Birmingham, and that Dr. John Johnstone be requested to accept the office of President-elect.

That the thanks of this Meeting be given to the Secretaries of the Association, Dr. Hastings and Mr. Sheppard, for their highly valuable services, and that they be requested to continue their services for the ensuing year.

That the Council for the past year be requested to continue their services, and that the following gentlemen be added, and that they have power to increase their number :—

Mr. Ransome, Manchester.
Mr. Wilson, Ditto.
Dr. Burdett Steward, Droitwich.
Dr. Feild, Worcester.
Dr. Lloyd, Ludlow.
Dr. Symonds, Bristol.
Dr. Brandreth, Liverpool.
Mr. Dodd, Chichester.
Mr. Proud, Wolverhampton.
Mr. T. Griffith, Wrexham.

That Dr. Darwall, of Birmingham, be requested to deliver the retrospective Address at the Anniversary Meeting for 1834.

That Dr. Kerr, of Northampton, and Mr. Turner, of Manchester, be requested to draw up a Report on the present state of our knowledge on Anatomy, and present it to the next Anniversary Meeting.

That Dr. Chas. Henry, of Manchester, and Mr. Jennings, of Leamington, be requested to draw up a Report on the present state of our knowledge of the Chemistry of the Animal Fluids, as illustrative of Pathology, and present it to the Anniversary Meeting for 1834.

That the following Gentlemen be a Committee to draw up a Report on Vaccination, founded on the replies to the Questions on the subject of Vaccination proposed by Dr. Baron, and present it to the Anniversary Meeting for 1834.

Dr. Baron, of Cheltenham.
Dr. Conolly, of Warwick.
Dr. Bevan, of Monmouth.
Mr. Hebb, of Worcester.
Dr. Malden, of Worcester.
Dr. Evans, of Gloucester, Secretary.

That in furtherance of the objects stated in the Report of the Council, the following Gentlemen be requested to accept the office of Foreign Correspondents, with such additions as may seem desirable to the Council and Secretaries :—

Dr. Conolly, for America.
Dr. Lomax Bardsley, for France.
Mr. Hebb, for Holland.
Dr. Forbes, for Italy and Spain.
Dr. Prichard, for Germany.

That Dr. Traill, Professor of Medical Jurisprudence in the University of Edinburgh, be appointed an Honorary Member of the Association.

That the thanks of this meeting be given to Dr. Johnstone, our late President, and that he be appointed a permanent Vice-President.

That Dr. Nieuwenhuys, of Amsterdam, Foreign Correspondent for Holland, be appointed an Honorary Corresponding Member of this Association.

That Dr. Baron's proposals for establishing a Library, and also a Benefit Fund, be printed and circulated with the Report of the Council and the Retrospective Address.

That in future, notice of any business to be brought before the Anniversary Meeting, be given to the Secretaries three months previous to the Anniversary Meeting, and be circulated with the proposed Report of the Council.

That the Secretaries of the Association be directed to address to the Committee appointed by the House of Commons to enquire into the state of Parochial Registers, a letter expressing the great satisfaction felt by the Association, that the improvement of this important branch of Statistics has been taken into consideration by the Legislature, and respectfully submitting to the Committee that great benefits might be expected to accrue to Medical Science, and consequently to the community at large, if arrangements were made for recording the *causes of deaths* in the provincial registers of mortality.

That a Subscription be opened for creating a Fund, to enable the Association to give Prizes for Essays connected with Medical subjects; the said fund to accumulate until Five Hundred Pounds be subscribed, after which time the yearly interest shall be appropriated to the before-mentioned objects.

Thanks were moved to the Chairman.

N. B.—All Papers, and other Communications, to be addressed to the Secretaries, Dr. Hastings or Mr. Sheppard, Worcester, and forwarded carriage free.

Those Members who have not an opportunity of paying their Subscriptions to a Member of the Council resident in their district, are requested to pay it through the medium of their own Bankers, to Messrs. Robarts & Co. London, for Messrs. Berwick & Co. Worcester, on account of the "Provincial Medical and Surgical Association."

Gentlemen wishing to join the Association, are respectfully requested to apply to some Member of the Council in their immediate district; or to Dr. Hastings, or J. P. Sheppard, Esq. the Secretaries, Worcester.

The Council are desirous of publishing, with the next part of the Transactions of the Association, an accurate list of the Medical Officers of every Provincial Infirmary and Dispensary. They, therefore, will feel obliged if the Members of the Association will, within a month from the receipt of this volume, forward to the Secretaries, at Worcester, (under cover of a frank) a list of the Medical and Surgical Attendants, of the Medical Institutions in their respective districts.

AN

ADDRESS

DELIVERED AT THE

FIRST ANNIVERSARY MEETING

OF THE

PROVINCIAL

MEDICAL AND SURGICAL ASSOCIATION,

JULY 19th, 1833.

BY EDWARD BARLOW, M. D.

Physician to the Bath United Hospital, &c. &c. &c. &c.

THE Constitution of the Provincial Medical and Surgical Association enjoins that at each anniversary meeting, an address shall be delivered retrospective of the Medical occurrences of the year. The provision is judicious, and its principle especially applicable in a Society which looks forward with proud aspirings and animating anticipations to extending the boundaries of the Science which it coalesces to promote, for to mark what is already done is indispensable for guiding those endeavours by which more is to be effected.

It is with great humility that I undertake the office of delivering this address on the present occasion, impressed, as I am, with the conviction of my incompetency to fulfil, adequately, the task assigned me. I did hope that it would have been committed to other and far abler hands, and I used my best

endeavours to have it so allotted. High as is the honour to be so deputed, I sought not the distinction, but, on the contrary, waved it, so far as I could consistently with the feelings which I entertain towards those who pressed it on me, and with the duty which I owe to the Association. My objections were overruled, and I have now only to acquit myself of the obligation thus reluctantly incurred, in the best way that my humble powers admit, trusting to the kindness of my auditors for the indulgence which I so much need.

The greatest difficulty of the task is, perhaps, that to which its novelty gives rise. It is a novelty to review, formally, the medical occurrences embraced within the compass of a year ; at least it is novel to me to find myself in a situation such as I now fill. Hitherto I have been a humble student of Medical Science, gleaning knowledge as I could, and too conscious of how much remained to be learned to attach any high value to what I had acquired. Diligence and humility were the qualities for which I had most occasion. Others, such as I have been but little accustomed to exercise, are also needed to fulfil adequately my present duty. In discharge of it, a higher tone is requisite ; more confidence, more pretension, become almost indispensable, where, in the mere notice of transient events, it is hardly possible to avoid either expressing or implying some determinate judgments respecting them. It is my unfitness and want of preparation for acting either the censor or the critic, that makes me even at this moment shrink from the office which I have, perhaps, too rashly consented to undertake. In

future, the course of procedure will be clearer; the objects will be more defined; and the precise nature and limits of the task being better understood, it will be more easy both to collect materials, and arrange them in that order which perspicuity requires. In the present instance, topics worthy of notice crowded on the mind so abundantly and in such confused assemblage, as to render the task of arrangement extremely difficult, if not hopeless. To conceive the outline of an address suited for this occasion, required a mind more comprehensive than mine; to collect materials, arrange them in perspicuous order, and allot to each subject its due consideration, needed greater leisure and far more ability than I could command. All that I can pretend to is, to notice briefly and imperfectly such topics as appear to me connected with our more immediate purposes, the order of succession being influenced more by casual association than by any preconceived design.

Among the more prominent occurrences of the past year, I may be excused for giving precedence to that which more immediately interests those whom I have now the honour of addressing, namely, the formation of the Provincial Medical and Surgical Association. When we consider the purity of purpose in which this design originated, the absence of all selfish or interested views on the part of its promoters, the zeal with which it was espoused, and the sacrifices of time and labour at which many of its members have ministered to its advancement, we cannot but feel some glow of conscious exultation in being numbered among its earliest supporters.

For the first conception of this undertaking, we are indebted to the acute and comprehensive mind of the distinguished founder, who, perceiving the advantages of such co-operation, proceeded with promptitude and zeal to realise the project from which he expected so much advantage to result. On his merits, and on the gratitude due to him for thus opening to us a career of effective exertion and practical usefulness, in which to acquit ourselves of the obligations which we owe to science and humanity, I am forbidden to dwell. But my feeble voice is not needed to enforce that which all who now hear me must spontaneously feel.

For his exertions, his best and most acceptable recompense was that which he derived from the fulfilment of his wishes, by the assemblage of medical practitioners who collected around him last year at Worcester, when the Association was so happily instituted. Of that memorable day we are now met to celebrate the first anniversary, and I feel that I only express the sincere and earnest wish of all who now hear me, in my fervent prayer that each succeeding year may find us pursuing diligently the good work in which we have engaged, and that we may leave to those who succeed us, some evidence that we have not lived in vain.

In order, however, to fulfil the designs of the founder, to realise the good which the association is capable of effecting, it is necessary that all who join its ranks should engage cordially and zealously in that co-operation by which alone enquiries so comprehensive can be adequately pursued. Each member of the association should feel himself bound, by

a direct pledge, to render his utmost aid in promoting the ends which we have in view. These are to investigate truth, and to establish on the sure basis of philosophic induction, the principles of medical science. To this purpose all may contribute, however humble their talents or acquirements. Each individual may present some offering to the store of facts from which general conclusions are to be drawn. The truths which we seek are in nature, and from the observation of nature are they best learned. In collecting the evidences on which inductive reasoning is to be exercised, every fact is valuable, provided it be accurately observed and faithfully reported. And here it is that circumspection is needed. However on our guard against the delusions of fancy, we are all too prone to view facts through the medium of preconceived notions. In this there is no dishonesty, no intention to mislead, for we deceive ourselves ere we deceive others. What I advert to is a tendency inherent in the mind itself, which unconsciously biasses the judgment, and even affects our simple perceptions. The sources of prejudice arising from this tendency, have been fully and ably exposed by the great Father of inductive Philosophy, and all who wish to avoid them should study deeply the masterly elucidations which he has given of the various "idols of the mind." They should also bear continually in mind the limits which he has shown to circumscribe philosophic enquiry, and the means by which alone it can be successfully pursued. These limits cannot be more distinctly and explicitly stated than in his own expressive words.—"*Homo, naturæ minister et interpres, tantum facit et intelligit,*

quantum, de naturæ ordine, re vel mente observaverit: nec amplius scit, aut potest." What we have chiefly to guard against, is the admixture of speculative reasonings with alleged facts. I have no wish to confine observers to meagre facts, or to interdict the reasonings which these suggest, for to do so would be to stop enquiry, and render useless the best powers of the mind; but I would inculcate a special and necessary caution that the reasoning be not suffered to vitiate the fact or overshadow it. Let it at least be pure and prominent; let it hold the first place, and all reasoning be subordinate until multiplied evidence verify the fact and justify a general principle being deduced. With this reserve, imagination may exercise itself in whatever flights it pleases. Such flights are harmless so long as the conceptions of fancy are not confounded with the truths of nature. These are to be ascertained not by imagination, however lively, nor by reflection, however deep, but by patient, diligent, and accurate observation: "*non fingendum nec excogitandum, sed inveniendum quid natura faciat aut ferat.*" It may seem pedantic to quote maxims so trite, and superfluous thus to dwell on truths so familiarly known, so universally recognised; but they are of such vast importance, that they cannot be too oft repeated, nor too deeply impressed.

Next in interest to the formation of our association, is that splendid combination of talent which, having first congregated at York, in 1831, held its first anniversary at Oxford last year, "the British Association for the advancement of Science." The principles on which this admirable society is founded,

the arrangements devised for giving energy and efficiency to its labours, the intellectual powers engaged, and the profound science by which these powers are directed in their aim, hold out a confident hope of every branch of natural science advancing henceforward with a rapidity and steadiness hitherto unexampled. That such labours should essentially benefit that branch of science which we more immediately profess, it can need no argument to prove. So comprehensive is the science of physic, that it seems to embrace all the knowledge of which human intellect is capable. It would be difficult to name a branch of science from which physic does not derive some aid, and of which some knowledge is not necessary for completing the attainments of the accomplished physician. Several of the branches, however, to the cultivation of which the energies of the British Association are expressly directed, have so intimate a connexion with our art, as to constitute a part of its elementary education. Chemistry cannot be advanced without direct assistance being rendered, not only to our pharmaceutical operations, but also to our physiological and pathological researches. Another branch promises to supply information of great value, in which we have been hitherto greatly deficient, namely, Meteorology. The varying conditions of the atmosphere have hitherto received but very inadequate investigation. Indeed, the subject exceeds what individual endeavours can accomplish, and by such instrumentality alone as the British Association, from its vast extent, possesses, can such researches be adequately pursued. That they bear directly on our branch of science will be

readily admitted. Dependent as we are for our very existence on the atmosphere which we breathe, we cannot know too intimately the properties which it possesses, or the changes which it undergoes.

Surrounded by influences which reach us through the medium of the atmosphere, we should have a clearer conception than we yet possess of those influences, and of the effects attributable to them. With the several changes of the atmosphere in respect of weight, temperature, humidity, we are familiar, and we have instruments in common use by which to note the exact measure of each. But this knowledge has been too little applied to the illustration of health and disease. A dry atmosphere often proves irritating to the lungs. Dr. Paris mentions that he has long been in the habit of recommending to persons confined in artificially warmed apartments, to evaporate a certain portion of water whenever the external air has become excessively dry by the prevalence of the north-east winds which so frequently infest this island during the months of spring, and that the most marked advantage has attended the practice. He notices, also, the remark of a lady, who, suffering from pulmonary affection, had observed that whenever her hair went out of curl, she was sure to be better.

Of the influences which electrical changes in the atmosphere exert on the animal frame, we know very little. Yet many persons are very sensible of them on the approach of thunder storms, at which time they are generally attributed to the right cause. There is reason to believe that such changes produce direct effects on the functions of life more than

practitioners are at all aware of. The fact has oftentimes forced itself on my attention, that diseases of different kinds assume, at different times, an inflammatory character, or its opposite. In a tolerably wide range of dispensary practice I oftentimes find that, for weeks together, no case calls for blood-letting, when all at once an inflammatory character presents itself, and numbers imperatively require the lancet on the same day. Of the cause of this I profess my ignorance, but my conjectures incline to atmospheric influence, more especially to the influence occasioned by variations of electric condition. To investigate such changes, and determine their effects, would be no unworthy exercise of medical research.

An interesting report on the recent progress and present state of Meteorology, by the Professor of Natural Philosophy in the University of Edinburgh, was presented at the Oxford Meeting of the British Association. The Association also has professed its determination to pursue a systematic course of observation and experiment, calculated for supplying the facts on which an improved system of meteorology may be founded. Mr. Snow Harris has, for several years, been diligently cultivating the same branch of science at Plymouth, and has devised some very ingenious apparatus for noting electrical changes in the atmosphere. Many other philosophic minds are similarly occupied, and we may entertain a reasonable expectation that their united labours will, in no long time, collect our loosely scattered knowledge, and arrange it in some consistent and harmonious system.

A natural association leads me next to consider the formidable epidemic with which several parts of these Kingdoms were so severely visited during the past year. My notice of it, however, must be very brief, for the subject has already been discussed almost to weariness, and any elaborate review of the various opinions and doctrines maintained respecting it, would occupy far more time than could be devoted to it on the present occasion. It may not be unprofitable, however, to offer a few remarks on its causes, its character, and its treatment.

That the immediate cause was a specific poison conveyed by the atmosphere, there seems to be no dispute. The nature and source of this poison, however, have been the theme of much keen argumentation, some contending for a highly contagious character, while others have altogether denied the disease being contagious. It will be long ere this question can be set at rest, and the general doctrines of contagion must be rendered far more perfect than they yet are, ere any conclusion can be drawn which will be admitted by all parties. Many "idols of the mind" require to be dispossessed, ere the minds of the controversialists can view the subject with the philosophic calmness and freedom from prejudice which so grave an enquiry especially demands. Ere the disease reached our shores, it had prevailed extensively, and for several years, in our Eastern dominions, and it is well known that in that quarter of the globe the prevailing opinions were on the side of its not being propagated by contagion. On such a subject the opinion of an obscure individual can be of little worth; yet I may be permitted to remark

that, so far as a careful examination of the several controversies has enabled me to form any judgement, the weight of evidence appears to me decidedly in favour of those who ascribe the disease not to the effluvia emanating from affected bodies, but to vitiation of atmosphere derived from other sources. What these sources are we know not, and most probably never shall discover. In the economy of the Universe are many facts which our finite powers are unable to scrutinize with effect; many mysteries which we cannot penetrate, and for the very sufficient reason that they were never intended by Almighty wisdom to be cognizable by human ken.

Plague, pestilence, and famine, have, in all ages, visited the earth at intervals, and they have not been permitted without a wise design, however inscrutable this may be by our feeble intellects. Ordinary diseases, which arise for the most part from direct violation of natural laws, we may scrutinize so as, by ascertaining their causes, to acquire the power of preventing or remedying them. But when the pestilence arrives which traverses whole nations, involving in its apparently indiscriminating sweep, as well those who habitually obey the natural laws as the habitual violators of them, our puny philosophy is of slight avail for tracing such visitations either in their efficient or final causes, and we have only in humility of heart to bend to the infliction and adore the Providence which ever chasteneth in mercy. To arrest the course of such dispensations is as hopeless as the expectation is irrational. "May one turn again the arrow that is shot by a strong archer? the Mighty Lord sendeth the plagues, and who is he

that can drive them away. Behold famine and plague, tribulation and anguish, are sent as scourges for amendment."

I am well aware of the truth averred by the philosophic poet, that

> "The universal cause
> Acts not by partial but by general laws."

I am sensible of the error of ascribing, on trivial occasions, to the special intervention of Providence, consequences which only result from the ordinary laws of nature having been violated. I am not ignorant how unphilosophic it is deemed, to dwell on final causes, when our laws of philosophizing limit us (and for the most part wisely) to ascertaining those which are efficient. Yet there are occasions when our boasted induction, so powerful in developing those natural laws which we are permitted to discover, is utterly vain for disclosing truths, which, it may be, are wisely concealed from us.

With many it is sufficient argument against such visitations being Divine dispensations, that the more immediate sufferers are not marked as the victims by any peculiar culpability. But to such it may be answered, that Divine judgments are very different from human; that the ways of Providence are not like our ways. We might find it difficult to reconcile with our notions of justice, why the sins of the fathers should be visited on the children even to the third and fourth generation; yet we know that justice the most perfect has so decreed. But we have direct assurance on this point, for He who could not err rebuked the false judgment of deeming those who undergo peculiar sufferings to be greater sinners

than others. The Galileans whose blood Pilate mingled with the sacrifices, the individuals on whom the tower of Siloam fell, were declared by our blessed Lord not to be sinners above all who dwelt in Jerusalem. It is, therefore, no argument against pestilence being a Divine infliction sent for our chastisement, that the individual sufferers were not more guilty than others who escaped. Of the Divine justice we can know but little, comprehend little. It may be that such visitations are sent to lower our pride; to arrest our career of sensual indulgence; to lead us to pay more regard to the poor and needy, by shewing that our neglect of them may, by a just retribution, be visited on ourselves. These hasty remarks are offered not to check enquiry, nor repress the investigation of physical causes, but to abate the pride of knowledge, and to teach us to be content with our own ignorance, whenever research into the mysteries of nature transcends our powers.

The character of the late epidemic admits not of adequate illustration by any reference to ordinary pathology. An overwhelming impression was made on the vital powers, all these sunk under it, and death ensued with a rapidity almost unexampled. The accession seemed like the effect of a virulent poison, almost as incapable of being traced, or the impression made, or the changes induced, as the subtile influence of the Upas Antiar or the Woorara. The impression was, for the most part, sudden; several functions of the body became deranged, almost suspended; exhaustion rapidly ensued, and death speedily closed the scene. How far death

was attributable to the extent of functional derangements, or to the continued operation of the morbific cause, we have no means of ascertaining. The former were sufficiently variable to prevent our regarding any one as constituting a pathognomic feature.

That the diarrhœa, however generally attendant, was not entitled to this distinction, is now sufficiently understood, and the correctness of the name assigned, from this symptom, to the disease, has, with great propriety, been questioned. The adoption of this name, implying, as it did, an admission of the seat and nature of the malady, was not harmless, for on this assumed theory a practice was founded, the success of which afforded but little ground of exultation. At first stimulants and opium in large doses were deemed the grand panacea, but they have come to be distrusted, and, in the end, were very generally abandoned.

There can be little doubt that practitioners were much misled by the dogmas promulgated, and that the earlier practice, if not more successful, would, at least have been more satisfactory to those who conducted it, if the judgements of medical men had been left free to act on general principles, unbiassed by the authoritative and confident dictations with which the treatment suited to this complaint was prescribed.

On the treatment pursued, its varieties and success, there is but little temptation to comment. Judging from the results, it would be difficult even now to pronounce on what course should be preferred if this horrible malady were to re-appear, for whatever the treatment, the relative mortality was

but little affected by it. Something we have learned as to the juvantia and lædentia; some progress has been made in bringing its various anomalies within the pale of ordinary pathology; but, notwithstanding much diligent observation and extensive experience, our knowledge of its nature and progress remains lamentably defective, and we are still without any conclusive theory on which to found consistent or successful practice.

Ere I dismiss the subject, I wish to offer one brief remark on the reproach which it became customary to cast on medical science, in consequence of its insufficiency to cope with this formidable distemper. In the justice of this reproach I cannot concur. Medical science, founded on a knowledge of the physiology of animal life, professes to rectify its derangements when the causes of disease are transitory and the animal powers sufficiently entire to work out, under judicious regimen, their own restoration. A permanently operating cause, or prostrate powers, must set all medical agency at defiance. In the late epidemic a morbific cause, subtile and virulent, laid all the powers of life prostrate, and as well might medical science be blamed for not resuscitating a body when sinking, from an overdose of arsenic or prussic acid, as for not ensuring the cure of intense cholera. It is not unworthy of remark that, on the subsidence of cholera, there appears to have occurred, in many places, a considerable abatement of ordinary disease. This was so evident at Bath, as to excite the attention of the physicians of the United Hospital, to which the whole of the sick poor of Bath and its vicinity daily resort. In order to ascer-

tain the extent of this decline, I took the average of dispensary, or out-patients, on my days of attendance, and found that for the first nine months of the year, within which period the cholera prevailed, the average daily number was 120, while for the last three months it declined to 84. As the applications of out-patients to the United Hospital are unrestricted, disease and poverty being sufficient passport, the attendance of the sick poor at the hospital may be regarded as a fair measure of the healthfulness of the city. I pretend not to account for the fact, but it is sufficiently extraordinary to justify its being recorded. It could not have proceeded from the mortality occasioned by cholera having swept away the ordinary invalids, for in the period of three months, during which cholera continued in Bath, the deaths from this disease did not amount to fifty, in a population exceeding fifty thousand.

In furtherance of the objects which the annual address is designed to promote, it would here be desirable to survey the medical literature of the past year, both domestic and foreign, in order to determine what acquisitions to the science have been gained, what advance effected. But it is obvious that the necessary limits of this discourse would scarcely admit even the titles of works published, to be recited, much less any analytic examination of their contents. Indeed on this subject, as well as on several others connected with the purposes of this society, it will be expedient to follow the example of the British Association, by proposing each year particular topics of enquiry, and deputing either competent individuals, or small sub-committees, to

collect information and furnish reports on them at subsequent meetings. In this way, may full justice be done to each topic, and the co-operative energy which constitutes the distinguishing feature of the association, be successfully and beneficially called forth.

Of the medical publications, however, of the past year, one may be more particularly noticed as partaking, from its extent and the number of contributors, somewhat of the nature of a national undertaking, namely, the Cyclopædia of Practical Medicine. In many of its essays, too, it accomplishes what has been just noticed as most desirable, by presenting, on several important topics of medical enquiry, full, comprehensive, and well-digested expositions, shewing the present state of our knowledge on each. In this country a work of this kind was much wanted, and that now supplied cannot but be deemed an important acquisition. The difficulties of the undertaking were not slight, and it required great energies to surmount them. These energies, however, were possessed by the able and distinguished editors, who, with diligence and labour such as few can know or appreciate, have succeeded in concentrating, in a work of moderate size, a body of practical knowledge of great extent and usefulness. Of the execution of the work I may be allowed to quote the opinion of an enlightened and unprejudiced critic, who, in the review given in the Edinburgh Medical Journal, thus speaks of it. "To comparisons we are in general averse, but we must say that it is by an immeasurable distance superior to the *Dictionnaire des Sciences Medicales,* in selection,

concentration, and precision, and all other qualities which render a didactic work, either for reference or any other purpose, valuable. If the Cyclopædia be not superior to the *Dictionnaire de Medicine*, it is certainly not inferior to it, and, unless in the more extensive field which the latter work embraces, we should certainly say that it is superior. In many of the individual articles, the Cyclopædia has decidedly the superiority, and all the dissertations on the pathology and treatment of diseases in general in the English work, possess a more practical character, and bear the impression of being written by authors who have derived their information not through the spectacles of books only, but from the personal and actual use of their own senses."

The corresponding work of Dr. Copland, the Dictionary of Practical Medicine, is also entitled to particular notice, evincing sound talents and vast labour. With great truth has it been pronounced by one of its reviewers, "a miracle of industry."

The Hospital Reports of Dr. Bright, and the Pathological Illustrations of Dr. Carswell and of Dr. Hope, are works so useful in design and so splendid in execution, as to merit particular notice.

It is a natural transition from authors to teachers, and here I may congratulate the Association on the increased and increasing endeavours directed to the establishment of Provincial Medical Schools. These cannot fail to be of the highest utility, and must have a most beneficial influence on the rising generation, more especially of general practitioners. Instead of superceding the Metropolitan Schools, they will rather increase the usefulness of these by furnishing

pupils prepared to profit by their advantages. Heretofore young men having passed in the provinces the earlier years of apprenticeship, have, towards its close, gone to London to attend lectures and hospitals, quite unprepared to benefit by the opportunities thus afforded them. Limited in time, and overwhelmed with excessive occupation, the chief advantages derivable from the London Schools must have been very imperfectly attained. The case will be very different when they enter on their London studies, duly prepared by the elementary instruction which the Provincial Schools will henceforward afford.

Practical anatomy being the foundation of all medical education, I may be allowed once more to congratulate the society on its cultivation being at length placed under legal protection, by the Anatomy Act of last year. For a first attempt at legislation on a novel and difficult subject, there is, in the provisions of this act, but little to object to. It seems to work well, and to the satisfaction of those who are the best judges of its efficiency. But were it far more defective, its enactment would still deserve to be hailed as the proud triumph of sound sense over intellectual weakness, of natural and healthful feelings over sicklied sensibility and false humanity. That humanity is little to be prized, which, in dwelling on the sensibilities of the poor, whether real or imaginary, overlooks their substantial welfare. It may suit the sentimentalists of the *boudoir*, who, perhaps, have never entered a poor man's hovel, and who know little of his condition, beyond what some fictitious narrative may have pourtrayed, to declaim

on the horrors of dissection, and in the refinements of their philanthropy, to protest against the bodies of the poor being subjected to processes from which they would themselves, in their weakness, recoil. But they who really know the poor man's wants, will have little sympathy for this imaginary source of suffering, for they know how very little such feelings enter into his conception of the ills of life. To the poor the physical wants and sufferings of their condition are quite enough to engross their cares, and of the means by which these ills are alleviated, they will be tolerant, their untutored sense sufficing for just conclusions when fallacies are not forced on them by affected sentimentalism and pseudophilanthropy. To the poor even more than to the rich, is it important that the foundations of medical science should be laid in anatomy, that the humblest class of practitioners should be thoroughly versed in the structure and functions of the animal frame. So accessible are the poor to these obvious truths, so sensible of the advantages derivable from the examination of dead bodies, that they not unfrequently proffer those of their relations to their medical attendant for such examination, soliciting it, even, in many instances, as the express desire of the deceased. If the subject were presented to the poor in its simple truth, divested of those colourings which a false humanity imparts to it, they would readily recognise the indispensable necessity of anatomical investigation, and freely acquiesce in whatever measures might be deemed most advisable for promoting it. And here it may not be amiss to notice one error into which the friends of anatomical science have,

through their zeal for its cultivation, been misled. A fashion has sprung up of individuals bequeathing their bodies for dissection, and the practice has been lauded as the climax of disinterested benevolence. While I mean not to detract from the good intentions of the parties, I must acknowledge that I view the procedure itself in a very different light.

How the body is disposed of after death, or under what circumstances it becomes resolved into its primary elements, can be a subject of little anxiety to any sound mind. Abstractedly the disposal of our earthly remains is a matter of perfect insignificance. The philosopher so regards it, and were he to consult merely his own feelings, he would not hesitate to devote his remains to whatever purpose would make them most serviceable to his fellow creatures. But he is not the only one concerned; there are others whose feelings on the subject should not be overlooked. Few persons are so isolated in life as to have no relatives or friends whose feelings still cling even to their cold and senseless remains. In the disposal of the body after death, the feelings most concerned are those of survivors, and however desirous an individual may be, either from benevolence or vanity, to consign his own body to the hands of the anatomist, he has no right to gratify his own inclinations by such a bequest, unless well assured that in so doing, he would give no pain to others whose feelings he is morally bound to respect. The feelings which still cling to the earthly frame after the spirit has departed, are natural and amiable, and though their excesses need restraint, they should neither be wholly extinguished, nor wantonly vio-

lated. But if liberal feelings are to be evinced, if there is to be a sacrifice of private sensibility to the public good, the true test of such dispositions would be, not the bequest of the testator's own body, by which he barters the feelings of others far more than his own, but the surrender of the bodies of those who were dear in life. This surrender few would make, and happily no necessity exists for any such outrage. The mode now legalised for supplying the anatomical schools, is effectual and unexceptionable, inasmuch as it provides adequately for a great public want, with the least possible violation of private feeling.

There are many topics to which, in a survey of the past year, the attention of the Association might be directed with advantage, but the necessary limits of this address preclude their introduction. Some of them have been already noticed in the Report by the Council, whose recommendation cannot fail to incite the members of the Association to an assiduous exercise of their respective talents in whatever way the purposes of the Association may most require. Anatomy, animal chemistry, and vaccination, have been judiciously selected as fit subjects for special reports, and it is to be hoped that the design of the Council, in this proposition, will not be frustrated by any want of zeal or diligence.

It should incite both diligence and zeal to reflect on the next topic which my present duty requires me to notice, namely, the medical obituary of the past year. Within the past year, several distinguished and zealous labourers in the field of medical science have closed their career of useful and ho-

nourable exertion, and while we mourn their loss, we shall best evince the sincerity of our regrets by the earnestness with which we endeavour to supply their place. I must pass briefly over each, and confine myself chiefly to those whose acknowledged eminence has already given them imperishable fame in the annals of our science.

In May, 1832, medical science sustained a great loss by the death of Dr. Andrew Duncan, the late Professor of Materia Medica in the University of Edinburgh. Although not distinguished by any brilliant discoveries, nor devoted to any particular branch of science, it is difficult to conceive a career of exertion more valuable than that which Dr. Duncan pursued. With unwearied diligence, extensive knowledge, sound judgement, and excellent feelings, did he exert his best energies for the general cultivation of the science of physic, and for the improvement of its practice. His labours are too well known to require any special notice: ample evidence of them exists in the pages of the distinguished journal which he so long and so ably superintended. In one respect did Dr. Duncan confer a most valuable boon on his professional brethren, by opening to them the stores of German medical literature, with which he was peculiarly conversant, and with which the pages of his journal were continually enriched. Bland in his manners, and kind in disposition, his memory will long be held in affectionate regard by all who had the happiness of his personal acquaintance.

The same month witnessed the death of one whose name must ever be dear to science, and whose loss,

from the extent of his labours and the success with which they were pursued, may well be deemed irreparable. Baron Cuvier was not a member of our profession, but his labours belong to our science, and we should be wanting in every feeling of gratitude if we did not acknowledge how largely he has contributed to advance it by his unexampled exertions in the cultivation of comparative anatomy. It would ill become me to dwell on the merits of this pre-eminent naturalist, for my best powers must fail to do justice to them. To the British Association the subject more properly belongs, and already has his eulogy been pronounced by Professor Buckland, in a strain of impassioned eloquence which it is impossible to read without deep emotion and ardent admiration of the excellencies displayed.

It may not be uninteresting to advert here to the organization of brain with which this powerful mind was connected, as it bears directly on a branch of science, to which, however it may fail to be fully appreciated in our day, future times will do ample justice. The following extract from a Journal not favourable to phrenology, states facts which the most sceptical must acknowledge are entitled to some regard.

"Soemmering, as the extreme weights of the healthy human brain, gives two pounds five ounces and a half, and three pounds three ounces and three quarters, the great majority being intermediate between these two; and M. Berard in some recent examinations, has arrived at nearly the same results. But the brain of M. Cuvier weighed three pounds ten ounces four drams and a half, being much above

the extreme weight mentioned by Soemmering. Besides, the cerebellum and tuber annulare were compared with those of a male adult, and found to exceed them, in weight only, by a dram and a half, so that in M. Cuvier the excess was almost wholly confined to the extraordinary developement of the anterior lobes, that is, to the organs of the intellectual faculties. Again, according to M. Desmolins, one of the characters of the brain with which superiority of intellect seems to be associated, is the great extent of the surface resulting from the number and depth of the convolutions, so that a great expansion of this kind might be comprehended within a cranium of moderate dimension. Viewed in this light, the brain of M. Cuvier was even more remarkable than with respect to its size, none of the distinguished anatomists who were present having ever witnessed convolutions so numerous or anfractuosities between them so profound. It was at the upper and anterior part of the brain that this conformation was most strikingly developed." Without pledging phrenology for the accuracy of all that is stated in the foregoing passage, I willingly give it as illustrating the connexion between high mental powers and large developement of the anterior and upper portions of the brain.

In the following month were removed from us by death, two philosophers, of whom, however little connected with our profession, some notice may be permitted in a medical obituary, Sir James Mackintosh and Jeremy Bentham. Sir James has been chiefly known as a legal and political character, yet we may claim him as a member of our body, for, fifty

years ago he took a medical degree, and even then his talents were held in such estimation, that he was offered a lucrative appointment in Russia, which, on its being declined by him, was afterwards conferred on Sir Alexander Crichton. May it not be warrantable to trace to the liberal cultivation included in his medical education, the developement of those faculties and powers by which this highly gifted man became afterwards so distinguished.

To Mr. Bentham we can certainly lay no such claim, but he was always the steady friend and able advocate of our profession, and he testified his regard for its pursuits by the bequest of his own body for anatomical purposes. That this unusual desire was no sudden thought, but a calm and deliberate purpose, appears from the will in which it was first introduced bearing date 1769, when Mr. B. was only 22 years old; at his death he had reached his 85th year. The love of science and the benevolence of purpose manifested by his appropriation of his remains, are unquestionable, though opinions may differ as to the expediency or justifiableness of such bequest. From the remarks lately offered, it is obvious that I regard it as of very doubtful propriety, and my persuasion is that it will have but few imitators.

In July a death occurred, which I notice chiefly from its giving occasion for the first biographical sketch given in our Transactions, that of Dr. Joseph Thackeray, of Bedford. As all who now hear me must have read that brief memoir, I shall only say that if genuine worth and pure benevolence entitle the possessor to a place in our remembrance, the

amiable and estimable subject of this memoir will not be soon forgotten.

In August Sir Everard Home departed this life, at the venerable age of 77. His works have been too conspicuous in the medical literature of our country, to need them being specially noticed by me. Independently of his personal merits, Sir Everard Home's life must interest us as more particularly connecting our time with the brilliant era of the Hunters.

At a still more advanced age, the venerable Scarpa closed his career, in his 86th year, having for 63 years held his professorship of anatomy. The number of his works, the extent of his researches, the transcendent talent with which these were conducted, and the practical usefulness of all his labours, both anatomical and surgical, fully justify the epithet of illustrious, with which his name will ever be distinguished.

The next death which I have to record, is one on which, if I was to yield to the impulse of my own feelings, I should dwell with deep and painful interest. In December died at Boston, in the United States of America, Dr. J. G. Spurzheim, the coadjutor of Dr. Gall, and the able advocate and expositor of the doctrines which Dr. Gall first promulgated. It would be out of place here to enter on any vindication of the science which these distinguished fellow-labourers established by evidences sufficient to carry conviction to every unprejudiced mind.

Of the rancour with which it was early assailed, and of the puny endeavours still made from time to time to decry it through means of ridicule and abuse, I take little account, being well assured that its truths

will survive and be acknowledged, when its objectors shall have passed into oblivion. My own faith was no effect of raised imagination, but the result of calm and deliberate judgement, and after two and twenty years of observation and reflection, it remains unshaken. However the doctrines of Spurzheim may be impugned, his personal merits will be readily acknowledged by all who ever had the happiness of holding intercourse with him. With a vigorous intellect were combined moral qualities of the highest order, and dispositions the most amiable; and it was impossible to know him without blending with the admiration due to the profound philosopher, sincere esteem and the warmest affection for the man.

Ere the year closed, one more death took place, which, though occurring at the early age of 32, I cannot pass over—that of Dr. James Crawford Gregory, of Edinburgh. Brief as was his career, it was marked by talents of no ordinary kind, and by a zeal for science, from which, had it pleased God to prolong his existence, the happiest results might have confidently been expected. Eminent as were both his father and grandfather, the powers which he displayed furnished ample proof that in sterling talents he had not degenerated.

Ere I close this address, I wish to offer a few remarks on a subject which concerns us all, one that involves the best interests of the science to which we are devoted, namely, the state of the profession. This ought to be such, that all its branches should be in harmony with each other, cordially co-operating for the advancement of science and the public good. That we are so inclined is abundantly mani-

fested by the occasion which has now brought us together; but in the present political organization of the profession, there are many disturbing forces which tend to weaken its energies, and to place individual interests, real or supposed, in collision with those duties which science and humanity enjoin. Our private interests and public duties ought ever to be in unison; and were the profession regulated on sound principles, there could be no discordance. Each member would choose the department which best suited him, and petty jealousies, which so often mar the happiness of life, would be unknown.

It would be both unsuitable, and greatly exceed my present limits, to enter here on any exposition of the evils to which a complex and discordant state of the profession gives rise. They are very generally felt, and must soon engage the attention of the legislature, which, it is to be hoped, will give them a full and scrutinising investigation. One reason, and a principle one, why this has been so long delayed, has been the total want of unanimity in the profession itself respecting the reforms needed, or the legislative provisions required. However this want of unanimity may be deplored, we are little likely to see an end of it so long as the present organization of the profession obtains. By a forced and unnatural division of offices, the profession has been split into departments, each attempting to pursue a separate course, while the natural unity that characterises the whole has been too much overlooked. Each department has had assigned to it a separate superintendance, the aim of which has been to advance its interests without reference to the other

branches, while there existed no institution for regulating and combining the whole, so as to adapt their several energies for their collective well being, and the public good.

My only object for introducing the subject on the present occasion, is to inculcate the necessity in all future projects of reform, of taking comprehensive views, so as to embrace the collective interests, and allot to each branch its due consideration. So long as this shall be neglected, partial legislation can do no good, without inflicting a far greater portion of evil. What we now need, is not a rectification of slight errors, but a general revision of the whole profession, and such arrangement of it as would render the good of each branch, compatible with that of the whole. Unless this be done, heart-burnings and discontents will prevail, to the great injury of the profession, the discomfort of its members, and the sensible abatement of those energies by the due exercise of which the public would so signally benefit. Government of the profession by separate and independent corporations, has been fully tried, and has utterly failed; as experience can no longer be pleaded in its favour, it would now be wise to try whether that course which reason and sound policy dictate, might not be beneficially substituted; whether the establisment of one presiding institution, in which all minor corporations should be consolidated, might not realise a system of adequate protection and efficient control, such as the separate and independent authorities have never yet afforded. By the establishment of such an institution, no revolutionary changes need take place; each department

continuing, as now, to exercise its functions to whatever extent the public exigencies might demand; but the adequacy of each branch to its allotted duties could be more effectually ensured; collisions at once inconsistent and injurious would be prevented; equality of qualification in each respective branch be promoted, so as to remove all necessity for partial restrictions; freedom be thus given to individuals to practise, as interest or inclination might incline; and that harmony be established among the several branches, which the public good, the interests of science, the collective welfare of the profession, and the happiness of the individuals composing it, imperatively require. An arrangement of the profession which should accomplish these valuable purposes may yet be distant. In the interim, it is consolatory to contemplate how much extensive association, founded on liberal principles, such as have assembled us here this day, may effect in redeeming the evils which defective and erroneous legislation have entailed.

By it the jealousies so unworthy a liberal profession cannot fail to be allayed; kind and friendly feelings must be promoted; talents called forth; zeal excited; sciences advanced; and, in consequence, the public good proportionably advantaged. So long as we have it in our power to do so much good, under the guidance of sound judgement and right feelings, we may patiently await those salutary reforms in medical polity, which, sooner or later, an enlightened and patriotic legislature must accord.

PART II.

Medical Topography.

SKETCH OF THE MEDICAL TOPOGRAPHY OF THE HUNDRED OF PENWITH, COMPRISING THE DISTRICT OF THE LANDSEND, IN CORNWALL.

BY JOHN FORBES, M. D., F. R. S.

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THE great object of Medical Topography being to trace the causes of diseases, with a view to their prevention, the aim of the Medical Topographer ought to be to detail all the circumstances, physical and moral, which can in any way exert an influence over the health of the inhabitants of the place which he undertakes to describe; and to investigate the nature of this influence, and the manner of its operation, until it terminates in the production of formal bodily disorder. A complete Treatise of Medical Topography would, therefore, comprehend a most varied and extensive range of information respecting the locality treated of. The principal heads under which the various subjects in such a

treatise might be ranged, would appear to be the following:—PART I. HISTORICAL. 1. The Natural History, comprehending all the external physical influences inherent in the particular locality, and existing independently of the human inhabitants. 2. The Civil or Economical History, comprehending all the influences, physical and moral, rising out of, or having reference to, the social condition of the inhabitants.—PART II. STATISTICAL. 1. The Statistical Results of these influences as exhibited in the Physical History of the inhabitants, the state of their health, and the laws which regulate procreation and mortality. 2. The Medical Results of these influences, or the diseases incident to the inhabitants, and their consequences.

In drawing up the following Sketch, I have endeavoured to keep this arrangement in view; but no one can be more fully aware than myself, how very inadequately and imperfectly the details have been executed. I have wished to express this imperfection by the title which I have given to my paper; but I could not feel satisfied without a more formal declaration of it in this place. In addition to my want of capacity to do the subject justice, under any circumstances, I have laboured under an accidental disadvantage in treating it, which has rendered my memoir much more defective than I had hoped it would be when I began collecting materials for its composition: I allude to the circumstance of my having left Cornwall before I had collected much of the information which I considered necessary for the completion of my plan.

With all its imperfections, however, I by no means consider the following Essay as useless; and even if it possessed less value than I myself attach to it, I would much rather risk my credit by publishing it, than deprive my fellow-members of the benefit which they may reap from my example. My plan I believe to be good; and I cannot deny myself the justice of having prosecuted my inquiries with zeal, so long as I remained amid the subjects of them.

In order to account for the distant date of most of the statistical details contained in the Memoir, I wish further to state that it is twelve years since I left Cornwall, and that almost all the materials of which it is composed, were collected during my residence there. Some few particulars, indeed, I owe to a more recent communication with my Cornish friends, a circumstance which will explain the seeming incongruity of the dates in some parts of the paper.

PART I.—HISTORICAL AND ECONOMICAL.

CHAP. I.—OF THE NATURAL AND PHYSICAL HISTORY OF THE DISTRICT.

Geographical Position.—The counties of Devon and Cornwall constitute a large promontory or imperfect peninsula, washed by the British and Bristol Channels, which projects westward into the Atlantic considerably beyond the main body of the Island of Great Britain. As the western border of Devonshire is nearly in the same parellel with the shores of Wales, nearly the whole of Cornwall, consequently, is to the westward of the rest of England. The

greater part of the county is also to the southward of all the other parts of England, except part of Devonshire; and the district of the Landsend is in a considerably lower latitude than the most southern part of Devon.

The extreme length of Cornwall is about seventy-eight miles. Its breadth, at its junction with Devon, is somewhat more than forty, and it gradually decreases in extent to its western extremity. At the distance of one-third of its length from Devon, it is eighteen miles; at two-thirds, it is only thirteen; and on the shores of the Mounts-Bay, within twelve miles of the Landsend, it is in one place only five miles broad. The mean breadth of the county is about twenty miles. The Hundred of Penwith, or District of the Landsend, comprises the western extremity of the county from sea to sea. It extends about fifteen miles from the Landsend on the southern, and nearly double that distance on the northern shore, its mean length being about twenty-five, and its mean breadth about seven miles. It contains 90,957 statute acres, or about 142 square English miles. The promontory of the Landsend lies in north latitude 50° 4′, and west longitude 5° 41′. It is exactly 300 miles from London by the mail roads.

The whole of Cornwall constitutes a low mountainous chain, considerably elevated, even on its coasts, above the surrounding sea. In stretching westward, this chain gradually decreases in altitude as well as breadth; yet, even at its extremity, it still preserves its hilly character, and overlooks the ocean with lofty and precipitous shores. The mean

height of the Hundred of Penwith above the level of the sea, is probably between 400 and 500 feet, and its highest hills certainly do not exceed 1000 feet.

Thus situated and characterised, the Hundred of Penwith certainly possesses many striking natural peculiarities, as compared with most other districts in Great Britain. Its bold and narrow Promontory projected, as it were, into the Atlantic Ocean, midway between the coasts of France and Ireland, more than a hundred miles from the main body of England, and a still greater distance from the two former Kingdoms,—it is, at the same time, removed from the influence of many causes common to the rest of the island, and subjected to others peculiar to itself. In addition to its natural peculiarities of climate, &c. this district is remarkable for containing a large number of miners, a class of men whose whole habits and mode of life are extremely unlike those of a mere agricultural or manufacturing population. These two circumstances, together with the facility of isolating the district so as to compare the results of our investigations with those afforded by other situations, seem to render its Medical Topography a subject of more than usual interest.

Physiognomy.—As has been already observed, the whole of this district possesses a hilly character, and, with the exception of a few very small strips of low coast, is considerably elevated above the sea. Generally speaking the surface is throughout very uneven, being broken in many places by a succession of hills and vallies, yet, upon the whole, perhaps, rather possessing the character of a ridge of low hills, sloping on all sides to the sea, than of a continuous

intermixture of hills and vallies. The whole line of coast, with two small exceptions, is uniformly and remarkably precipitous, exhibiting, in many places, some of the finest cliff-scenery in the Island. This character of the coast is particularly favourable to the pursuits of the geologist, laying open to him, in every direction, by the most splendid natural sections, the structure and relations of the rocks of which the country is composed. Nor is the physiognomy of the rocks in the interior less remarkable. On every hill the granite is seen protruding in the most fantastic forms from the scanty and imperfect covering of soil. These rocks, under the names of *Tors* and *Carns*, have been alternately the objects of the antiquary and geologist, and must ever continue to attract the notice of the traveller.

With the exception of the beautiful shores of the Mounts-Bay, in the immediate vicinity of Penzance, and of some rich corn land in the parishes of Buryan, Sennen, and St. Levan, near the Landsend, the general aspect of this district is rugged and cheerless, destitute alike of the composed beauty of a level country, or of the grandeur of a mountainous one. Perhaps one-third part of the district consists of uncultivated moor land, of a particularly wild and sterile character, while the remainder, even where most cultivated, possesses little of the *appearance* of a rich and fertile country. Many circumstances combine to produce this effect, but more especially the almost total absence of trees and hedge-rows throughout the district. To this must be added the general prevalence of stone fences in place of the hedge-rows of other parts of England, the huge

blocks of granite strewn over many of the cultivated fields; the low, round-backed naked hills, always near and always in view; the rude and mean aspect of the cottages; and, above all, the devastation occasioned by the operations of mining. This art, more than any other, tends to destroy the natural beauties of a country, inasmuch as it at once annihilates the whole of the vegetable productions near its operations; and, by covering large tracts with heaps of stones and rubbish from the bowels of the earth, superadds features which are not only ugly and disagreeable in themselves, but which become still more destructive of the charm of scenery, by suggesting ideas of vulgar ruin and desolation. As partly compensating for this cheerless aspect of the general surface, it is but justice to this interesting district to state, that some parts of it—indeed of small extent—more especially the vicinity of its capital, Penzance, are extremely beautiful, rich, and well-wooded, while almost the whole of its sea-views and cliff-scenery are unrivalled in magnificence and picturesqueness.

Alluvial soil and surface.—On the hills and higher grounds in this district, the alluvial deposits, as might be expected, are extremely scanty or altogether wanting; but in the low grounds and vallies, the deposition is often very abundant.

The nature of this covering varies, generally speaking, with the subjacent rock; being on the *killas* or slate districts, of a soft clayey character, with a trifling intermixture of small rolled fragments of the strata beneath; and in the granite districts, of a looser and more sandy character, with a large intermixture of rolled masses of granite, often of

immense size. As it does not enter into the purpose of this memoir to treat of these deposits in any other view than as they are allied to Medical Statistics, I shall content myself with observing that, in many parts of the district, they are uncommonly fertile in the ordinary agricultural productions; that as well from the loose and friable nature of these, as from the uneven surface of the country, the general character of the soil is light and dry; and (with one or two very trifling exceptions) that marsh or bog land is entirely unknown. The only exception to this is furnished by a marsh between Penzance and Marazion, adjoining the sea, and partially saline, running parallel with the shore. It was formerly a mile in length and about a furlong in breadth, filled with reeds; but at the present time (1833) it is much lessened by draining and the beneficial encroachments of agriculture. On the northern shores, also, along the banks of the Estuary of Hayle and in the parish of Gwithian, there are some small strips of marshy land, but of very inconsiderable extent, and produced rather by the irruption of the sea water than the stagnation of the land springs. In the parishes of Lelant, Phillack, and Gwithian, there is a ridge of low hills of calcareous or shell sand, extending a couple of miles along the shore, and reaching inland from half a mile to a mile in different places. This accumulation of sand is evidently of comparatively recent formation, and must have been derived from the sea. It covers the native soil of the district, and is itself now covered and confined by a crop of the common sand weed or bent. Dividing these sand hills is the Estuary of Hayle, run-

ning nearly two miles inland, and leaving, at low water, an extensive plain of fine sand.

Waters.—There is nothing approaching to the nature of a lake, nor even a natural pond, in this district; and, owing to its small extent and peninsular character, its streams are hardly of sufficient size to be entitled to the name of rivers. They make up in number, however, for what they want in size. Originating in the central ridges, they flow towards the sea on all sides, but chiefly to the north and south, and exhibit, in the rapidity of their course and purity of their waters, the life and beauty peculiar to the streams of a mountainous country. This profusion of running water is of the utmost benefit to a district wherein the operations of mining require the employment of so much machinery; and the great utility of the Cornish streamlets becomes the cause of the destruction of all their beauty and purity. The processes of pounding the ores at the mill, *(stamping,)* and of washing the gravelly soils in search of alluvial tin, *(streaming,)* very frequently divert them from their natural course, and convert them into dirty puddles of a red or white colour.

This district is equally rich in numerous and copious springs of excellent and very pure water. They are found in every village, and are seen at the foot of every hill. Several of these, of unusual extent and purity, have, in former times, obtained so much renown for their healing virtues, as to be dedicated to saints; and two still are surrounded by the ruins of the chapels built for the accommodation of their visitors.* These sacred springs contain no

* *Euny Well,* in the parish of Sancred, and *Colurian Well,* in the parish of Ludgvan. The resemblance between the name of the spring last mentioned, and the ancient term for an application to diseased eyes (Κολλυριον—*Collyrium*) has not escaped the notice of antiquaries.

mineral impregnation, yet they still retain, in some degree, the confidence of the neighbouring peasantry as specifics in certain diseases, more especially of the eyes. Several natural springs are slight chalybeates, and many which are connected with mines are impregnated artificially with the salts of iron and copper. With these trifling exceptions, the whole waters of the district are remarkably free from mineral impregnation, and are, consequently, perfectly soft and delicious. So plentiful are the natural springs, that pump-water is more rarely used than in most other places.

Geology and Mineralogy.—The geological structure of a district being, in general, but remotely connected with the health of the inhabitants, I shall, in this place, content myself with a very brief outline of that of the Landsend.

The physical structure of Cornwall is very simple as far as regards the number and relation of its component rocks: it is rendered both complicated and curious, in many parts, by the vast number of its metalliferous veins.

There is every reason to believe that the central or main rock of Cornwall consists of granite, and that the interrupted chain of hills composed of this rock, which extends from Dartmoor, in Devonshire, to the Landsend, is merely the protuberant shoulders of one continuous mass.

Reposing upon this central ridge, and in general *dipping from it* on all sides, there is, in the language of geologists, a *formation,* consisting principally of varieties of clay slate, but containing subordinate strata of very different rocks. These are different

in different districts, but consist principally of hornblende and felspar rocks, and sparingly of limestone and serpentine.

In the Hundred of Penwith, the especial object of this memoir, the proportion of the granite and slate formations, (which alone exist there) at the surface, is nearly equal, the former, perhaps, being rather the greatest. In the more immediate district of the Landsend, bounded on the eastward by a line drawn from Saint Michael's Mount to the Estuary of Hayle, the whole substratum is granite, with the exception of a narrow and interrupted border of slaty rocks on some part of the shores. In the remaining part of the Hundred, there is some granite, also, but the greater part consists of slate formation. This formation, in this district, exhibits two varieties; the one consisting exclusively of clay slate, and the other principally of a series of rocks composed of hornblende and felspar The latter variety appears to exist in the more immediate vicinity of the granite; the former at some distance from it. The clay slate exhibits a considerable variety of structure, as do the several rocks composing the other variety of the formation. These latter appear in the form of alternating strata of hornblende rock, hornblende slate, greenstone, slaty felspar and clay slate. These rocks invariably incline *from* the main body of the granite under a varying angle of from 20° to 40°. At the immediate junction of this with the superincumbent slaty and hornblende rocks, there is often a close intertexture of parts, but never any thing like an intermixture on the great scale, much less any alternation of strata. They are essentially and inva-

riably distinct. Where covered by the soil, the granite is generally found decayed or pulverulent on the surface, and in many places exhibits, under these circumstances, a stratified appearance. But this is only a superficial, and, I believe, an adventitious feature. The whole of this district, both in the granite and slaty parts, is traversed by an infinity of metalliferous veins. These, in general, run east and west. They vary extremely in their size and length, and also in the character of their contents. The principal metallic ores contained in them are tin and copper; but they contain many other metals, besides a great variety of other simple minerals. In some parts of the district these veins are much more plentiful and productive than in others, and are, consequently, much more worked.

The quantity of tin and copper annually raised in this district is immense. In 1822, the amount of tin exported from the hundred was calculated, by a most intelligent friend, there resident, at about 1,200 tons, valued at about £120,000. In the same year, the amount of copper exported from the district, was estimated at 40,000 tons of ore, containing about 3,000 tons of copper, and producing about £215,000.*

This district is extremely rich in simple minerals, a list of which will be found in the Appendix to this paper.—*(See Appendix, No. I.)*

* In the year 1831, the total amount of tin raised in Great Britain, was 4,176 tons, the whole of which, with the exception of about 80 tons, from Devon, was raised in Cornwall. In the same year, the total copper raised in Great Britain was 14,465 tons; of this, 12,099 were raised in Cornwall, and sold for £835,812. One-third part, at least, of the tin and copper raised in Cornwall, is produced in the Hundred of Penwith.—*Transactions of the Royal Geological Society of Cornwall,* Vol. iv. p. 491.

It has been already observed, in speaking of the soil, that the nature of the alluvial covering varies, generally, with that of the subjacent rock. It is, nevertheless, true, that at the points of junction of two rocks of different nature, as, for example, of granite and killas, the rolled stones and soil derived from one rock, are generally spread to some distance over the other. All over the country where these junctions exist, there is a belt of soil of equivocal character, to which the farmers, in some places, give the name of *flux country*; but it is generally found that it is the *granitic* or *growany* soil that encroaches on the killas territory, and not the killas on the granite. This is easily accounted for by the fact of the granite almost always lying higher than the killas, a circumstance which will necessarily give the direction I have noticed to any bodies moving on its surface. The extent of these encroachments is, however, remarkably small; for whenever we see a large boulder or block of granite or of greenstone, we may be pretty sure that, if not beneath our feet, rocks of this kind are near at hand.

From this brief sketch of the geological structure of this district, considered conjointly with its physiognomical character, the great dryness of the soil may be readily inferred. All the rain that falls on it, or the springs resulting from the partial accumulation and infiltration of this, are either absorbed by the friable soil, by the slaty strata, or are conveyed speedily down the declivities of the solid granite; while the short and declivous vallies, and the almost total absence of plain, afford little or no shelter for them after their descent. The exceptions already

mentioned are much too insignificant to demand any consideration in a hygienic point of view.

Climate.—After describing the physical characters of the district, it might seem more in order to give an account in the next place, of the organized beings of which it is the *habitat;* but, as vegetables as well as animals are equally dependant on the atmosphere, I shall, previously, give an account of the *climate* of this district, comprehending, under this term, all those atmospherical phenomena which are supposed, in any way, to influence health. And, as the various phenomena included under this division of our subject, possess an incomparably greater influence on the health and functions of the human body, than any or all those already mentioned, I shall bestow on their consideration a proportionable degree of attention.

The general character and peculiarities of the climate of this district depend, as in other cases, on its geographical position and physical configuration. Placed in the lowest latitude of our Island, its seasons ought, on this account, to possess a more genial character than those of the more northern parts. And this effect of geographical position is greatly heightened by other circumstances. The whole district possesses, as far as regards climate, all the advantages and disadvantages of a small Island; and, accordingly, any one acquainted with the principles that regulate the phenomena of climate, will have no difficulty in estimating, *a priori*, the character of that of the Landsend, if he only regards it as a small Island moderately elevated above the level of the sea, and placed at a distance of forty or fifty

miles to the westward of the most southerly point of the main land.

It may be proper here to state, that the documents on which the meteorological results which follow are founded, are the following:—1. An admirable register kept at Penzance, by my friend Mr. Edward Giddy, late secretary of the Royal Geological Society of Cornwall. This document comprehends a period of twelve complete years, from 1821 to 1832 inclusive; and gives a daily account of the temperature by the register thermometer, the state of the wind and weather, the fall of rain, &c. 2. A register of a similar kind, but without a rain-gauge, aud with the common thermometer, kept at Penzance from 1807 to 1820, by Thomas Giddy, Esq. father of Mr. E. Giddy. 3. A register kept by myself during a residence at Penzance from 1817 to 1822. Several of the statements about to be made, have already appeared in a small pamphlet on the Climate of Penzance, published by me in 1821; and in the second edition of my friend Dr. Clark's admirable work on the Influence of Climate, published in 1830. When not otherwise stated, the results of Mr. Edward Giddy's tables are those adopted in the text.*

In stating the various meteorological results, I shall, in most cases, place in opposition the corresponding results of the climate of London, to enable the reader to estimate, with greater readiness, the peculiarities of the Landsend climate; and I select

* Since this paper was sent to the press, Mr. Edward Giddy has paid the debt of nature, in the prime of life. He was an industrious and accurate meteorologist, a good practical mineralogist, and carried into science the rigid honesty that marked his private character.

the climate of London in preference to that of other places, as being best known, and as affording a fair mean of the climate of the interior of the southern half of England.

1.—*Annual Mean Temperature.*

Landsend (Penzance)	51.8°
London, ...	50.3°

2.—*Mean Temperature of the Seasons.**

	Winter.	*Spring.*	*Summer.*	*Autumn.*
Landsend, ...	44°	49.6°	60.2°	53.3°
London, ...	39.1°	48.7°	62.3°	51.3°

3.—*Mean Temperature of the Months.*

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May.*	*June.*	*July.*	*Aug.*	*Sep.*	*Oct.*	*Nov.*	*Dec.*
Landsend,	42.5	43.5	46.4	48.5	54.0	58.5	61.2	60.9	57.6	53.7	48.8	46.1
London,...	37.3	40.4	42.6	48.0	55.6	60.0	63.4	63.5	58.8	51.7	43.4	39.5

4.—*Difference of the Mean Temperature of Winter and Summer.*

Landsend, ...	16.2°
London, ...	23.2°

5.—*Difference of the Mean Temperature of the warmest and coldest months.*

Landsend, ...	18.7
London, ...	26.2

6.—*Difference of the Mean Temperature of successive Seasons.*

	Of Winter & Spring.	*Of Spr. & Sum.*	*Of Sum. & Aut.*	*Of Aut. & Winter.*
Landsend,	5.6°	10.6°	6.9°	9.3°
London,...	9.6°	13.5°	11.0°	12.2°

7.—*Difference of the Mean Temperature of successive Months.*

	Jan. & Feb.	*Feb. & Mar.*	*Mar. & Apr.*	*Apr. & May.*	*May. & June.*	*June. & July.*	*July. & Aug.*	*Aug. & Sep.*	*Sep. & Oct.*	*Oct. & Nov.*	*Nov. & Dec.*	*Dec. & Jan.*	*Mean*
Landsend,	1.0	2.9	2.1	5.5	4.5	2.7	0.3	3.3	3.9	4.9	2.7	3.6	3.1
London,...	3.3	2.2	5.3	7.6	4.3	3.4	0.1	4.7	7.0	8.3	3.8	2.2	4.3

* The more common divisions of the seasons is here adopted, *winter* comprehending Dec. Jan. Feb. and so on.

8.—*Absolute Range of the Thermometer.*

	Highest Extreme.	*Lowest Extreme.*	*Greatest Range.*
Landsend, (12 years,)	84°	19°	65°
London, (30 years,)...	96°	5°	91°

9.—*Mean Range of the Thermometer.*

	Annual Range.	*Monthly Range.*	*Daily Range.*
Landsend, ...	49°	24°	6.7°
London, ...	64°	34°	11.0°

10.—*Variation of Temperature of successive Days for the whole Year.*

	Mean Variation.	*Extreme Variation.*
Landsend, ...	2.6°	10°
London, ...	4°	18°

The preceding results place, in a striking point of view, the great peculiarity of the climate of this district, as to temperature: possesses, as has been already remarked, all the habitudes of a small island remote from any large continent: it exhibits, in a great measure, the qualities of what may be called the *ocean climate*. This is characterised essentially by a remarkable degree of *equability* of temperature or small extent of range above or below the mean. In this respect the district of the Landsend is superior to any other part of England, and, indeed, to any place in Europe of which we possess meteorological accounts. Madeira is the only climate which Dr. Clark considers as superior in regard to equability of temperature.*

As necessary consequences of the greater equability, it will be seen by the preceding statements that, although there is a difference of only $1\frac{1}{2}^{\circ}$ between the mean annual temperature of this district and that of London, there is a remarkable

* Influence of Climate, p. 63.

discrepancy between the different seasons at the two places. Thus it is seen that while the summer temperature of the district is rather more than 2° *lower* than that of London, the winter temperature is very nearly 5° *higher*. The spring temperature of both places differs less than one degree, and that of autumn is 2° in favour of the Landsend. It thus appears that while the winter is much *warmer* than that of London, the summer is considerably *cooler;* the autumn is as much warmer as the summer is cooler, while the spring is nearly equal at both places. The temperature of the whole spring at Penzance, as taken by the thermometer, is, indeed, rather higher than that of London ; still it will be observed, on referring to the tables, that this superiority is derived almost entirely from the month of March, the temperature of April being very nearly the same in both places, while that of May is more than a degree and a half *lower* at the Landsend.

The singularly small range of the thermometer in this district, gives rise to a remarkable difference in the relation of the temperature of the day and night, here and in some inland places; in summer the nights being as much warmer as the days are cooler, and in the winter both the nights and days being warmer. This will appear in a striking manner by comparing together the mean of the extremes, i. e. of the highest and lowest degrees of temperature, as shown by the register thermometer during the two seasons, at London and Penzance.

	Summer.		*Winter.*	
	Day.	Night.	Day.	Night.
London, ...	81°	42°	52°	23°
Penzance, ...	72°	49°	55°	31°
London higher,...	9°	—	—	—
Penzance higher,	—	7°	3°	7°

The geographical and topographical relations of the Landsend district, already commemorated, sufficiently account for the singular equability of its temperature. In this respect there is certainly no place in the British Dominions that equals it, except it be the neighbouring islands of Scilly. These, indeed, from possessing in greater perfection the qualities that promote equability of temperature, exhibit this peculiarity of climate in a still more eminent degree than the Landsend district. And as an interesting illustration of the influence of the qualities referred to, I will extract from my pamphlet on the Climate of Penzance, a comparative view of the temperature of this place and of one of the Scilly Islands, (Tresco) during 46 days of the months of September, October, and November, in the year 1819, from which it will be seen that the temperature of the Island (which is low, and only about two miles long and a mile and a half broad) is considerably more equable than that of the neighbouring peninsula of the Landsend.

	Penzance.	*Tresco.*
Mean Temperature during 40 days, ...	56.5°	56.5°
Maximum Temperature, ...	70°	67°
Minimum Temperature, ...	38°	43°
Extreme Range for the whole time, ...	32°	24°
Greatest diurnal Range, ...	13°	6°

In reviewing the foregoing account of the comparative temperature of the Landsend district, I think I cannot more correctly sum up the general results than in the words of old Carew, whose early work on Cornwall is the only one among the many that have been published, that possesses the raciness of originality.

"The spring visiteth not these quarters so timely as the eastern parts. Summer imparteth a very temperate heat, recompensing its slow fostering of the fruits with their kindly ripening. Autumn bringeth a somewhat late harvest, especially to the middle of the shire, where they seldom inn their corn before michaelmas. Winter, by reason of the south's near neighbourhood, and sea's warm breath, favoureth it with a milder cold than elsewhere, so as upon both coasts the frost and snow come very seldom, and make a speedy departure."*

Atmospheric Pressure.—From considering the topographical and other relations of this district, and more particularly (as will hereafter appear) its great humidity and the great force and variability of its winds, some peculiarity might be expected in the barometrical results. As far as my observations have gone, however, I have ascertained nothing further than that the general altitude of the barometer is less, and its range smaller, than in other parts of the Kingdom with which I have compared it.

The following table gives a comparative view of the barometrical results, for three years, at London and Penzance:—

	London.	*Penzance.*
Mean height, ...	29.82	29.61
Mean of the greatest heights of each month,	30.26	30.09
..... least.....	29.17	29.08
Absolute Maximum in three years, ...	30.62	30.42
..... Minimum, ...	28.22	28.28
Extreme range in the period, ...	2.40	2.14
Mean annual range, ...	1.95	1.68
Mean monthly range, ...	1.07	1.00
Mean of the greatest range for each month,	1.24	1.22

* Carew's Survey of Cornwall, p. 15.

As possibly bearing on the subject of health, I shall only further notice the marked effect of the easterly winds in raising the mercury, and of the westerly winds in depressing it. This will appear from the following statement, which gives the proportional prevalence of the two winds during the times that the barometer stood at its highest and lowest points during three years.

	Wind Easterly.	*Wind Westerly.*
	Days.	Days.
Barometer at its highest, ...	21	12
Barometer at its lowest, ...	20	22

Humidity.— Cornwall has ever been obnoxious to the charge of great humidity, and I can vouch for the accuracy of the charge as far as its western extremity is concerned. There falls at Penzance nearly twice as much rain as at London, the annual average at the former place being 44.7, and at the latter only 25 inches. The following table will show its distribution through the different periods of the year at both these places :—

Fall of Rain in Inches and parts of Inches in each Month and Season.

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Penzance, (12 yrs.)	3.7	3.3	3.4	2.9	2.9	2.4	3.1	3.8	3.7	4.6	4.9	5.5
London, (20 yrs.)...	1.9	1.4	1.2	1.6	1.8	1.9	2.6	2.1	1.9	2.5	2.9	2.4

	Winter.	*Spring.*	*Summer.*	*Autumn.*
Penzance, ...	12.5	9.2	9.3	13.2
London, ...	5.8	4.8	6.6	7.4

Number of Days on which Rain falls in each Month and Season.

PENZANCE, (12 Years.)

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
15.2	14.1	14.8	13.4	12.4	11.0	13.4	14.8	13.1	16.1	18.8	21.4	179.2

LONDON, (10 Years.)

14	16	13	14	16	12	16	16	12	16	15	18	178

	Winter.	*Spring.*	*Summer.*	*Autumn.*
Penzance, ...	50.7	40.3	39.2	48
London, ...	48	43	44	43

The number of days on which rain falls, as is observed by Dr. Clark, does not seem in proportion to the quantity of fluid precipitated. In Mr. Edward Giddy's Register, the average number of rainy days at Penzance during the twelve years, is 179.2, and he particularly remarks that, under this head, he comprehends "rainy, showery, and misty days; in short, all days on which there is any fall whatever, even a slight shower." In the tables of Mr. Giddy, sen. inserted in my pamphlet on the climate of Penzance, and comprehending a period of fourteen years, viz. from 1807 to 1830, the average number of days on which there was any fall, is 165. In the year 1821, according to my own Register, the number of wet days was 179, and the total fall of rain was 44 inches. In Mr. Moyle's account, kept at Helston,* about 14 miles from Penzance, for eight years (1821-1828) the number of wet days is stated to be 165, which accords exactly with the results of Mr. Giddy, sen.'s observations at Penzance. From these statements it must be admitted, that the great fall of rain in the Landsend district, is the consequence rather of more severe rains than of greater frequency of rainy days. It will be remarked as curious, that the average number of rainy days at Penzance, according to Mr. E. Giddy's Register, (the most exact) is very nearly the same as that of London.

The foregoing conclusion respecting the comparative frequency of rain at the Landsend, is certainly

* Helston is to the eastward, more inland, and on somewhat higher ground than Penzance. The average fall of rain at this place, according to Mr. Moyle, is only 36.9.

at variance with what I myself had been led to deduce from common observation during my residence there, and I believe it is different from the impression on the minds of the inhabitants generally. The greater frequency there than in other parts of England, of *showers*, at least, if not of *rainy days*, seemed universally admitted. I had said in my pamphlet published in 1821, "we have heavy showers on many of our finest days; and this is so well known and expected, that the circumstance is hardly looked upon as an inconvenience;" and Dr. Borlase, the accurate historian of Cornwall, who resided in this district, gave a similar opinion sixty years before. "Our rains in Cornwall, he says, are rather frequent than heavy or excessive; and we have very seldom a day so thoroughly wet, but that there is some intermission, nor so cloudy but the sun will find a time to shine."*

I am unacquainted with any hygrometrical observations that have been made in this part of the country; I cannot, therefore, give any precise statement either of the comparative or actual humidity of its atmosphere. There can be no doubt, however, that this is much greater than in the interior counties. Its situation alone may be deemed sufficient to prove this; but the fact is further demonstrated by many well-known peculiarities. There is much greater difficulty, for instance, of guarding against the oxydation of iron at Penzance than at London: and of preserving articles of dress, &c. from the effects *of damp*, a fact well known and ad-

* The Natural History of Cornwall, by William Borlase, LL. D. F. R S. Oxford, 1758, fol.

mitted by every one there resident. The great prevalence of westerly winds in this district will be more particularly noticed hereafter: now, this wind, if it does not always bring rain, certainly has always qualities of great humidity, sufficiently cognizable by the senses. The warm west winds often bring with them a sort of drizzly rain, sufficient to wet thoroughly, grass and other vegetables, or the clothes of a person exposed to it; while neither the rain-gauge, nor the roads or streets, show any indication of its presence, unless long continued.

Frost and Snow.—A consequence of the mildness of the winters, is the comparative infrequency of frost and snow in this district. It results from Mr. Giddy, sen.'s tables, that the average number of days on which snow has fallen in any one year, is very little more than two and a half; and, including the days on which hail showers are noted, it scarcely amounts to nine. It appears, also, that of the fourteen years included in the tables, there have been four on which no snow fell. Of course, the existence of causes to prevent the fall of snow will prevent its continuance on the ground; and the fact is, that snow never remains on the soil in the vicinity of Penzance more than a day or two, seldom, indeed, more than a few hours; and even on the highest grounds, in the centre of the narrow peninsula, it seldom has been known to continue more than a week or ten days.

The occurrence of frost is almost as rare; at least it is a very uncommon circumstance for the ponds to be frozen sufficiently to bear the weight of a man. The consequence is, that *skating* is entirely unknown

among those who have never left the district. I was informed by some old residents that, during a period of thirty years, a piece of water in the vicinity of Penzance was in a fit condition for skating only four times, viz. in 1788, 1794, 1814, and 1819. And this will not appear surprising when we reflect that during the thirteen years from 1807 to 1820, the thermometer was only 37 times below the freezing point.

Thunder.—Thunder appears to be of rarer occurrence in this district than in most others in the Kingdom. The historians of Cornwall, it is true, like all topographical writers, have occasion to record some severe thunder-storms which committed considerable damage; but these seem recorded rather from their calamitous events, memorable in a confined neighbourhood, than from any thing uncommon in their severity. From Mr. Giddy, sen.'s tables, it appears that the mean number of days on which thunder has been heard, annually, is only two and a half, and the greatest number of days in any one year is only seven. It also appears that the three winter months, January, February and March, are those in which thunder is most frequent; a circumstance, I apprehend, which is contrary to the state of the fact in most temperate countries, summer being the season when it most frequently occurs.

Winds.—"Touching the temperature of Cornwall," says Carew, "the air thereof is cleansed as with bellows, by the billows and flowing and ebbing of the sea, and therethrough becometh pure and subtle, and by consequence healthful." "This, notwithstanding," (he says in another place,) "the

county is much subject to storms, which fetching a large course in the open sea, do from thence violently assault the dwellers at land, and leave them uncovered houses, pared hedges and dwarf trees, as witnesses of their force and fury." Dr. Borlase gives the same account of the frequency and violence of the storms and squalls in Cornwall, and my own experience leads me to the same conclusion. Indeed, I think the climate of the west of Cornwall is fully as remarkable for its great variability in respect of wind and rain, as it is for the singular unchangeableness of its temperature. The following statements will shew the relative frequency of winds from different quarters; they are the mean results of eleven years:—

	No. of Days.
North Winds,	36
South Winds,	45
East Winds,	37
West Winds,	39
Winds from the intermediate points of N. and E.	38
..... S. and E.	36
..... N. and W.	76
..... S. and W.	58

It results from this table, that winds from all the southern points are, to those from all the northern, in the proportion of three to two; and that those from all the western points bear a nearly similar proportion to those from the eastern.

In regard of the relative prevalence of the different winds in the different seasons, it appears that easterly winds prevail nearly in an equal degree in summer and autumn; somewhat more in winter, and most of all in spring. Of course the westerly winds are

precisely the reverse. Easterly winds prevail most in April, and least in August, reckoning the months singly; of any two consecutive months they prevail most in March and April, and least in July and August; of any three consecutive months they prevail most in March, April and May, and least in the three following months, June, July and August.

The following statement, deduced from Mr. Giddy's tables, shews that easterly winds prevail by far most in spring, least in summer, and more in autumn than in winter:—

	Winter.	*Spring.*	*Summer.*	*Autumn.*
Easterly Winds, No. of Days	34	44	32	38

The relation of different winds to the temperature and humidity of a climate, is an important matter of consideration. In this district it is, generally speaking, true, that in the seasons in which westerly winds prevail most, there are most wet days; thus, in the months of March, April and May, there are only two days more of westerly than easterly winds, while in December, January and February, there are 21; accordingly we find the number of wet days in the former month is only 34, while in the latter it is 46. It is true, that in the three following summer months, the proportion of westerly winds is still greater than in the winter months, while the number of wet days is considerably less; but it must be remembered, that there is in the latter case the counteracting influence of the fine season.

The effect of the two different winds is so well known, that it is common to believe, when the wind is easterly, that there will be no rain; while, when it is in the opposite direction, however promising in

other respects the sky may be, precautions against the probable irruption of western showers, are seldom forgotten.

It may be stated, as a general fact, that the south and west winds are uniformly warm and soft, and the north and east winds uniformly cold and sharp. These unvarying effects on sensation are, as certainly, although in a lesser degree, indicated by the thermometer. In the winter and spring months, the north and east winds may be considered as having a temperature 6° or 8° lower than the south and west winds; and this is so constant a circumstance, that the change of the temperature is as regular as the change of the wind; that is, if the wind continues in its new direction for one or more days. The change of temperature is most remarkable when the wind is high, and, in this case, if the wind shifts suddenly, and continues still high, the change of temperature is very considerable in a short time. As this subject is curious and interesting, and has been too little attended to by writers on meteorology, I shall here give a short account of the more remarkable instances of these changes that occurred during the winter and spring months of two successive years, during my residence at Penzance.

1818. In *January*, at the beginning of a gale from the east, the thermometer was 45°, the following day it was 40°, and on the third, when the gale was at its height, it was 39°. In the same month, with a moderate wind from the west, the thermometer stood at 46°; on the following day this shifted a little to the southward of west, and increased to a pretty strong gale which lasted four days; during

this gale the thermometer stood at the average of 52°; on the fifth day the wind moderated and shifted to the N. W. when the thermometer fell to 43°

In *February*, in a brisk wind from the south-east, the thermometer stood at 45°. The wind continued high for four days, but gradually veered round by the S. to the S. W., and then to the N. W.; following the changes of the wind, the mercury rose to 53°, and finally fell to 40°.

In *December*, the wind being N. E. and very gentle, the thermometer stood at 37°; next day it changed to the S. W. and blew a moderate gale, when the thermometer rose to 47°; this continuing, with increased violence, the thermometer next day rose to 50°; on the following day, the wind getting moderate and changing to the eastward, the thermometer began to fall, and on the next day, the wind being then N. E, it stood at 41°. In the same month a change from a slight breeze from the west, to a gale from the S. W. raised the thermometer from 47° to 53° in the course of one day; and it fell to 41° on the wind moderating and coming round to its original point.

1819. In *January*, in a moderate breeze from the East, the thermometer stood at 43°; in the course of the two following days, the wind shifting to the S. E. it rose to 47°; in the two following, the wind becoming quite southerly, and blowing strong, the thermometer rose to 53°.

In *February*, in a gentle breeze from the N. the thermometer was 45°; next day the wind shifted to the S. W. and blew a good breeze, when the mercury rose to 50°; on the following day, the wind

being high from the same quarter, it rose to 54°; the wind (still high) then shifted round to the N. W. and the mercury fell to 49°.

In *March*, for the first thirteen days, the wind was moderate from the E. and N. E., and the average of the thermometer was 43°; on the next three days there was a brisk breeze from the N. W. during which the average of the thermometer was 46°; during the remainder of the month (15 days) the wind was either S., S. W., or W., and blew a brisk breeze, and the average height of the thermometer was 51°.

In *October*, from the 1st to the 15th, the wind was in general brisk. On two days it blew a strong gale, and during the whole time continued either S. or S. W.; the average of the thermometer was 59°. The wind then shifted to the N. and E., at which points it continued for the remaining sixteen days of the month, (with the exception of two days to the N. W.) and the thermometer fell to the average of 48°.

In *November*, for eleven days, the wind was northerly and easterly, sometimes blowing very strong from the N. W. and S. E.; at this time, the average height of the thermometer was 43°; it then shifted to the S. W. for two days, and then to the S., during which three days it blew a strong gale, and the mercury rose to 52°.

December was a very windy month. For nine days the wind was northerly and easterly, the average height of the thermometer being only 36°; on the sixth day the wind shifted to the W. and the mercury rose to 43°; on the following day there

came on a strong S. W. gale, which lasted six days, during which the average height of the mercury was 54° ; the gale still continuing, but the wind changing to the N. W. for two days, and then to the N. E. the mercury fell on the first day to 44°, on the second to 39°, and on the third to 37°.

During the prevalence of the south or south-west gales, there is very little difference of temperature between the day and night, as proved by the register thermometer. Sometimes there is no difference whatever ; and very commonly the minimum of the night is not more than 3° or 4° below the maximum of the day. This shews how very completely the influence of the sun is excluded by the dense vapour with which the air is loaded ; and during these *moist siroccos,* as they may be termed, the inhabitants may be said, without any metaphor, to be breathing the breezes of a climate milder than their own. When these south and south-west winds, so prevalent in winter, are very gentle, the sky is sometimes clear for many days together. On these occasions, the warmth and softness of the air are truly delightful ; and when, taken in conjunction with the beautiful scenery around Penzance, the calm, blue sea, the gay, green meadows, the myrtles and other exotic plants common in the shrubberies, one is almost tempted to forget that it is a British, and a winter landscape that he is contemplating.

As confirming and illustrating some of the peculiarities of elimate above detailed, I shall now briefly notice a few particulars respecting the vegetable products of the country ; as, after all, there can be

no doubt that the character of a climate is much more faithfully indicated by such natural tests, than by any instrumental, or artificial, means whatever.

1. The great mildness of the winter season in this district, is evinced by the growth, in the open air, of several plants which are either not natives, not cultivated, or are inmates of the green-house in most other parts of England. Among the rarer indigenous plants of this district, I may particularize the *Sibthorpia Europæa* as strikingly evincing the superiority of the winter temperature. This elegant little plant, when transplanted into the middle counties, is killed down in the winter, even in a sheltered garden. Among the tender exotics which are common in the shrubberies, the botanist will find several growing here without shelter, which are green-house plants in most other parts of England. Among the most conspicuous of the exotics is the Myrtle, which, even in its extreme shoots, is rarely injured by the cold of winter. All its common varieties, broad and narrow leaved, single and double, thrive equally well and flower plentifully. In the open garden these plants attain the height of from 12 to 20 feet. Geraniums are also common in the borders, but many of these, in the severer winters, are killed down to the ground. The Hydrangea seems as hardy as a native, and attains an immense size, as does also the Verbena Triphylla.

The following list of some of the tenderer exotics growing in the open air, in the neighbourhood of Penzance, in the year 1820, sufficiently indicates the mildness of the winters. Many others equally delicate, or more so, would, I doubt not, thrive very

well there; and it is probable the list of such is greatly increased since I left Cornwall.

*Agave Americana,
Amaryllis Vittata,
Arum Colocasia,
Azalea Indica,
Buddlœa Globosa,
Bocconia Cordata,
Coronilla Glauca, &c.
Calla Ethiopica,
Cistus Salvifolius,
Chrysanthemum Indicum,
Camellia Japonica,
Cyclamen Persicum,
Canna Indica,
Cheiranthus Tristis,
Dahlia (many varieties)
Daphne Indica,
*Dracocephalum Canariense,
Eucomis Striata,
Fuchsia Coccinea,
Geranium (several species of the African G.)
Hypericum Coris,
——— Crispum,
Hypericum Balearicum,
Hydrangea Docolor,
Haustonia Coccinea,
Hemerocallis Alba,
Lavendula Viridis
Lobelia Fulgens,
Myrtus Communis,
Mesembryanthemum Deltoideum,
Melianthus Mjaor,
Mimulus Glutinosus,
Magnolia Tripetala,
Metrosideros Lanceolata,
Olea Fragrans,
Pittosporum Undulatum,
Phylica Ericoides,
Protæa Argentea,
Pemica Nana,
Solanum Pseudo-capsicum,
Teucrium Frutescens,
——— Marum,
Verbena Tryphylla,
Westringia Rosmarinacea.

2. The progress of vegetation is so little checked during the winter months, that the meadows always retain their verdure, and, in milder seasons, afford even a considerable supply of grass to cattle.

3. It is customary for the gardeners and small farmers, in the vicinity of Penzance, to raise two crops of potatoes in one year. The first crop is planted in November, and is gathered in April, May and June; the second crop is planted immediately on taking up the first, and as late as to the middle of

* Not growing at present.

July, and is gathered in time to allow the preparation of the ground for the succeeding crop. The first or spring crop has, in general, no defence from the cold of winter, but the stable dung used for manure; and it is a very rare thing for the potatoes to be injured by the frost. Some gentlemen in the vicinity of Penzance have constantly new potatoes at Christmas, and through the whole of January and part of February, raised in the open garden, with no other shelter than some matting during the coldest nights.

4. In consequence of the two circumstances just mentioned, the rent of land in the immediate vicinity of Penzance, is remarkably high, being very commonly (in 1818) from 10*l.* to 12*l.* and, occasionally, as much as 15*l.* per acre.*

Cabbages and turnips for the table, are earlier in this district than elsewhere; the former being ready in the middle of February, and the latter in the end of March. Cabbages, indeed, as they are unaffected by the winter cold, may be so regulated as to be cut in any month in the year. The cabbage in general use (the early Cornish), is often killed by the severity of the winter in the midland counties. Brocoli is often ripe against Christmas; radishes against the first of April.

6. Owing to the comparative coldness of the late spring months and early summer months, vegetation is considerably less rapid, after it commences, than in other parts of the island. The trees in the vicinity of London, for example, are in full foliage long before they are so in this district, even in the most

* The Cornish Acre is one-sixth more than the Statute Acre.

sheltered vallies. The same remark is applicable to many of the garden shrubs and flowers.

7. The very low temperature of the summers, and the want of sufficient sunshine, prevent many of the common fruits from attaining that richness of flavour, and security of full maturation, which they possess in the inland counties. The vine very rarely ripens its fruit in the open air; and the wall-fruits, in general, are inferior, in point of flavour, to those of other counties, particularly the peach.

8. The apricot rarely produces any fruit, except in a few places, and then very scantily. The green-gage plum is nearly equally unproductive. The walnut and common hazel-nut very seldom bear any fruit, although the latter is sufficiently productive more to the eastward in the county.

9. A further consequence of the cool summers is the comparative lateness of the harvests in this district. This is, indeed, not very considerable, still it is sufficiently obvious. From an account now before me, of the date at which harvest commenced, on a farm in the immediate vicinity of Penzance, for a period of seventeen years, it appears that the average period of commencement is the 12th of August; the earliest is the 3rd, and the latest the 27th.

10. Cornwall, like Scotland, is proverbial for its want of trees; and it is more excusable than Scotland, for there they will grow if planted, here, in many cases, they will not. All the high grounds and exposed uplands, may be said to be nearly destitute of trees. In close and sheltered vallies they grow very well. Almost all sorts of shrubs grow very well every where, and also trees until they

attain a certain height. Such as grow to a height beyond that of shrubs, in exposed situations, are all stunted, and this is the case with the common thorn used for fences. All trees have their branches directed towards the east, from the predominance of westerly winds. The only tree that seems to disregard the injurious effects of the climate, is the Pinaster Fir. The Scotch Fir suffers as much as other trees.

Botany.—In the preceding section I have taken notice of several important circumstances relating to the vegetable productions of the district. I shall only further notice this subject by giving in the appendix a list of some of the rarer indigenous plants.—*(See Appendix, No. II.)*

Zoology.—In so confined a district as this, it is not to be expected that there should be much of interest requiring notice under this head. The cattle are in general small, both horses, bullocks, sheep and pigs. The three latter species of stock are reared in great quantities for the markets of the district, as are also all kinds of poultry, and are sold at very low prices compared with most other places in England. Owing to the want of cover, and the comparatively small extent of corn land, the common birds, and also domestic game of all sorts, are less plentiful than in most parts of England. There are no pheasants: eagles are unknown, and hawks rare. Nightingales have never been seen in this district. The Corvus Graculus is common on the sea cliffs; but although bearing the name of the *Cornish Chough,* the bird is by no means peculiar to this county. Foxes are found in considerable plenty, but hares are compa-

ratively rare. Owing to the peculiar mildness of its climate, this district, as in compensation for the paucity of its fixed inhabitants of the feathered kind, can boast of more than its proportional share of those of the migratory kind. In the winter months, snipes, and more especially woodcocks, are found in immense numbers. When the season is at all severe, the quantity of the latter brought to Penzance market in one day, is often very great. This may be judged from the fact of their being commonly sold (in 1819 and 1820,) on such occasions for six-pence each, and occasionally for four-pence. Snipes are equally plentiful and cheap, being frequently sold for three half-pence or two-pence a piece, and occasionally for one penny. In severe winters, most of the other kinds of wild fowl which are at all migratory, also appear in great abundance, being stopped, for a time, in their progress towards milder climates, by the termination of the land, and congregated at the Landsend by the gradual tapering of the county to that extreme point. The coasts of Cornwall are frequented by the common sea birds, but these offer nothing in their history or habits that bears relation to the subject of this essay.

I am not sufficiently conversant with the class of insects, to be able to say whether this district affords any thing remarkable in that department of natural history; although it seems probable that the peculiarity of the climate is productive of some peculiarity in their habitudes. Bees are sufficiently plentiful, and derive ample stores of excellent honey from the numerous heaths of the district. The apple-bug is common here, and marked by its wonted devastation.

The waters that so nearly surround this district, abound with fishes of all kinds, and afford occupation and food to a considerable number of its inhabitants. Into the natural history of these it is not my intention to enter, and I shall merely advert to such as are in any way related to the proper subject of this memoir. Among these the pilchard deserves particular notice. This fish, which is very like the herring, and so nearly allied to it in its structure and habits as to be considered by many as a variety of the same species, has been accustomed, from time immemorial, to frequent the shores of Cornwall in immense shoals. During the period of my residence in Cornwall, from 1817 to 1821, and for a few years previously, there was a most remarkable decrease in the quantity of this fish that visited the shores of the Landsend ; and for several years few or none were taken. In consequence of this change, the whole body of fishermen in this district were thrown into great distress, and the absence of the usual supply both of fish and of the money derived from the sale of them, produced a very sensible effect on the comfort and welfare of the labouring class of people. Of late years, however, the shoals of pilchards have returned to their old haunts, and spread once more comparative wealth and prosperity among the starving population. The following is the amount of pilchards exported from the Landsend district during a period of seven years, the last of which, only, can be considered as affording an approach to the average quantity caught in former times.

Year.	*Hogsheads.*	*Year.*	*Hogsheads.*
1817,.....	411	1821,.....	3,186
1818,.....	896	1822,.....	6,379
1819,.....	3,676	1823,.....	20,000
1820,.....	429		

The value of the fish, as sold for exportation, depends entirely on the quantity taken. In the year 1823, the average price was about £3 per hogshead, besides the government bounty of 8s. 6d.

A great number of persons, men, women and children, are, of course, employed in catching and preparing such a large quantity of fish; and it need hardly be remarked that the receipt of such a sum as £60,000 or £70,000 by these persons, or the total want of it, must render the *good years* or *bad years* of the fishery of vital importance in this community. The mode of catching and preserving the pilchards will be noticed hereafter.

Besides pilchards, there is an extensive annual fishery for mackarel and herring for exportation, besides the habitual supplies required for home consumption. These latter consist, principally, of cod, whiting, turbot, soles, plaice, surmullet, John Dory, gurnard, lobster, &c. &c. &c. all of which abound in the markets of the district, and are disposed of at uncommonly low prices. Besides these and other excellent fish, there is a great supply of conger eels, which are used in very considerable quantities by the common people. Lobsters and crabs are found in great plenty. It is evident that this class of fishes exists abundantly in the adjoining waters, both from the number and variety of shells thrown up on the shores in a perfect state, and from the vast accumulation of sand, in different parts of the coast, composed entirely of comminuted shells. Of this kind is the sand in the various bays near the Landsend, as well as the long range of sand hills, formerly noticed, in the parishes of Lelant, Phillack and

Gwithian. For a list of some of the shells found on this coast, *see the Appendix, No. III.*

CHAP. II—OF THE CIVIL AND ECONOMICAL HISTORY OF THE DISTRICT.

Having given, in the preceding chapter, some account of the nature and character of the locality on which the inhabitants are placed, and of those natural influences to which they are inevitably subjected, it remains to consider some of the other circumstances incidental to their situation and mode of life, which, although for the most part neither inevitable nor of fixed and uniform character, like the preceding, have, probably, as great and certain powers in influencing and modifying health. Previously, however, to the consideration of these, it will be necessary to give some account of the inhabitants, as far, at least, as regards their number, the nature of their occupations, &c.

Classes of Inhabitants.—By the census in 1821, the number of inhabitants in this district was 60,642. The number of families is stated to be 11,849, (being somewhat more than five persons to each family) of which are

Families chiefly employed in Agriculture, ...	3,081
Families chiefly employed in Trade, Manufactures, or Handicraft, ...	3,237
All other Families not comprised in these two classes,	5,531

It is impossible, from the Parliamentary returns alone, to ascertain, with any degree of correctness, the number of persons employed in any other occu-

pation, except that of agriculture; as it will be found, on reference to these, that the other two columns are filled up differently in different places. To a person, however, who is acquainted with the nature of the trade carried on in any particular district, these tables will furnish materials from which he may form a more precise classification of the inhabitants. In the district of the Landsend there is carried on hardly any species of manufacture, and only such handicraft business as is requisite for the demands of the resident inhabitants. Yet we find, from the official returns, that very little more than one-fourth part of the population is employed in agriculture. This gives a much greater proportion of persons in the other classes than is found in any part of England, except in the manufacturing districts, as will appear evident from the following comparative statements, in round numbers, of the proportion of persons employed in agriculture to those in the other two classes, as taken from the parliamentary returns.

	Proportion of Persons employed in Agriculture.	*Other Classes.*
Sussex, ...	6	6
All Cornwall, ...	6	10
All England, ...	6	13
Hundred of Penwith,.....	6	17

This seeming anomaly is explained by the great number of *miners* in the district, a class of men who are arranged in some parishes under the second head of occupation (handicraft) and in others under the last. Besides miners and persons employed in handicraft and trade, the only other class of persons

deserving a separate classification, are those employed in fishing, a pretty numerous class, as will appear from what has been stated in a former part of this paper. Including, then, all the individuals residing in the towns and villages who live either by any handicraft trade, or by trade in any form, viz. shopkeepers of all sorts, under the title of handicraft and trade, I would propose the following extension and amendment of the returns of this Hundred as not very distant from the truth :—

Families chiefly employed in Agriculture, ...	2500
..... Mining, ...	5000
..... Handicraft and Trade,...	2500
..... Fishing, ...	740
All others not comprised in these four classes, ...	1109
Total,.....	11,849

Another means for forming an approximative estimate of the number of individuals employed in mining, &c. is afforded by the militia returns. In Cornwall there are two classes of militia; the one confined to the persons employed in mining, the other to all the remaining male population liable to serve, the former being called the *Miners' Militia*, the latter the *Cornwall militia*. These two corps include all the male population between the ages of eighteen and forty-five, except fishermen, and a few other individuals who are exempt by law. In 1822, the respective numbers of these two classes of individuals in the district, as shown by the militia returns, were as follows :—

	No. liable to serve.	*Exempt.*	*Total Males from 18 to 45.*
Cornwall Militia,	2642	1395	4019
Miners' Militia,...	1638	1557	3195

This makes the proportion of miners to the other classes as four to five, much greater than I have allowed above; yet when we consider that the militia returns are made for each parish on oath, and that each class is strictly drawn from the individuals of that class, it cannot be doubted that this is a fair estimate of the number of miners in the district.

Occupations.—1. *Peasantry.* The general habits of the peasantry of this district are, of course, very similar, in most respects, to those of their brethren in other parts of the kingdom; and, consequently, being universally known, require no formal notice here.

2. *Artizans.*—The same remark applies to those employed in handicraft trades, and in all the other more common avocations of the labouring classes of society.

3. *Fishermen.*—The employment of the Cornish fishermen is of two kinds; the one, the daily, quiet one of catching fish for the home market; the other, the periodical and grand occasion of catching pilchards and mackerel for the foreign market. The home demand is not sufficient to require the active exertion of one-fourth part of the number of fishermen resident in the district; many of these, consequently, remain either very inactively employed, not employed at all, or employed in other kinds of labour, during the intervals of the pilchard and mackerel seasons. Indeed, all the various occupations formerly enumerated are, occasionally, blended in the practice of the same individual. Many of the miners are husbandmen, and not a few of them are both

fishermen and sailors. "So true is this," says Pryce, "that in St. Ives and Lelant, during the fishing season, they are wholly employed upon the water, to the great hinderance of the adjacent mines; and when the fishing craft is laid up against the next season, the fishermen again become tinners, and dive for employment in the depths of the earth."* In the ordinary proceedings of the domestic fishery there is nothing peculiar. Owing to the great mildness of the climate in the winter season, the Cornish fisherman is exposed to comparatively few hardships, and being well clothed and well fed, and exposing himself to no unnecessary risks, his health or his life but rarely suffers from the ordinary course of his employments.

In the pilchard season his exertions are often very great, but as this almost always happens in summer, there is even then seldom any risk of health. I have formerly adverted to the quantities of this kind of fish caught in this district; it is proper, in this place, to give a brief account of this extensive and important fishery, as it is a species of employment which, both immediately and in its consequences, must exert an important influence over the health of the natives of the district.

The precise region whence the shoals of pilchards that visit this coast, come from, is unknown, but the fact that the coast of Cornwall is the part of Great Britain where they first make their appearance, and that they subsequently are to be found on the western coasts of France and Spain, seems to prove that their course is from the west. They commonly reach

* Mineralogia Cornubiensis, p. 35. Lond. 1778, fol.

Cornwall about the middle of July, and usually remain there until October. But both the period of their arrival and departure, and also the course they take, are uncertain, and have varied greatly in different years. Fifty or sixty years since, they remained on the coasts till Christmas, and the fishermen were engaged in their capture five or six months, but now the season does not last more than two or three months. Some years ago, indeed, as was formerly observed, they either did not appear at all on the Cornish coast, or only for a few weeks, or even days. In former years they always appeared first on the northern coasts of Cornwall, towards the east, from whence they proceeded westward, round the Landsend, and then eastward along the southern coasts. Lately, however, they have, on some occasions, scarcely touched on the northern coasts, but have made their first appearance on the eastern parts of the south coast.

When the shoals make their appearance, the fishermen are directed to them by persons stationed on the neighbouring heights, who are called *huers*, from their raising a *hue*, and who announce the approach of the prey by the cry of *heva*. In a moment every man is at his post, and all is activity and eager expectation. The proper place where the nets should be cast or *shot* being ascertained, the boat containing the great net, or *stop sean*, as it is called, and which is often 300 fathoms long and 17 fathoms in depth, is rowed round the shoal, the net being at the same time thrown into the sea by two men, a work which is performed with such dexterity, that in less than four minutes the whole enormous net is shot,

and the fish enclosed; the ends of it being then fastened together it is moored, or, where the shore is sandy and shelving, drawn into shallow water, the bottom of the net being kept to the ground by leaden weights, while the top is buoyed up with corks.*

The quantity of fish thus inclosed and captured is sometimes enormous; one net has been known to inclose, at one time, as many as 1200 hogsheads, amounting to about three millions of fish. The inclosed fish are removed at leisure from their fold into boats, by means of small nets, by which a portion of the fish is separated from the main body and drawn up to the surface; they are then conveyed on shore to be cured or salted in cellars, and after remaining there for five or six days, they are packed into hogsheads for exportation.

The broken or refuse fish are sold for manure, and when mixed with sand, soil, or sea weed, constitute a valuable and lasting compost. It is a common saying in the district, that a single pilchard will fertilize a foot square of land for several years.†

4. *Miners.*—As the employment and general habits of this class of persons are very peculiar, and as they exert, as we shall afterwards find, a very marked influence over their health, it will be necessary to enter more fully into the history of their employment and mode of life. And in order to enable the reader to understand these more completely, I shall, in the first place, give some account of the nature of a mine and of the economy of working it. Perhaps

* Guide to Mount's Bay. Penzance, 1818.

† Ibid.

the clearest idea we can have of the nature of a metalliferous vein or lode, is that of a narrow rent in the rocky crust of the earth, approaching more or less to a vertical direction, and filled with metallic ores. The object of mining is to break down, and transport to the surface, the contents of this supposed rent; in other words, to cut out from the containing rock this thin metallic plane. To effect this, galleries, called, in Cornwall, *levels*, are driven horizontally on the vein, one above the other, and the ore, &c. produced by their excavation, are transported to the surface by vertical openings, called *shafts*, cutting the former at right angles. The horizontal galleries are, in the first instance, about two feet wide and six feet high, but varying, of course, according to circumstances, and being frequently extended much beyond their original dimensions. They are driven, one above the other, at intervals of from 10, to 20, or 30 fathoms. When extended to a certain distance from the original shaft, it is necessary for the sake of ventilation, as well as for other reasons, to form a second, which traverses, at right angles, all the galleries in the same manner as the first. The distance between shafts is very various, being from 20 to 100 fathoms. Frequently a communication is made between two galleries only, by a partial shaft (called *a wins,)* in the interval between two shafts. When there are more lodes than one worked in the same mine, as frequently happens, galleries often run parallel to each other at the same depth. In this case they often communicate by intermediate galleries, driven through the rock, (or *country*, as it is called in Cornwall) which are termed

Longitudinal

SECTION of a MINE,

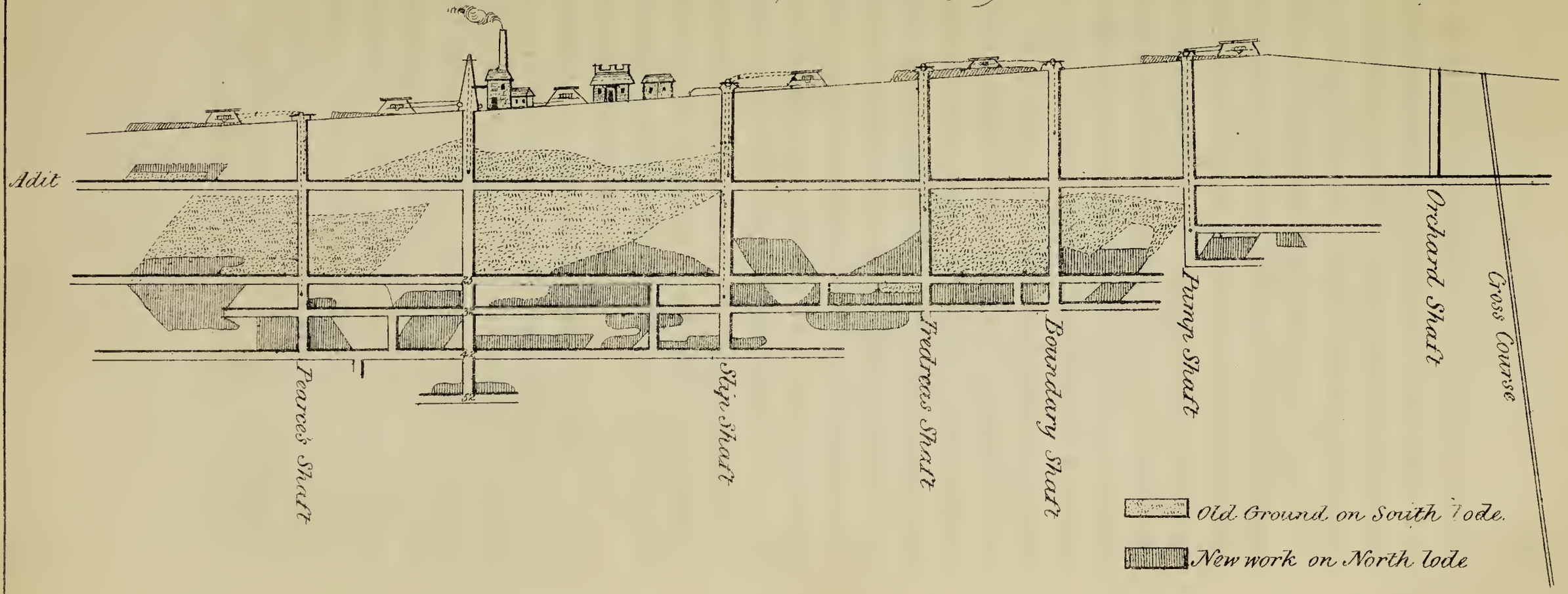
(Owen Vean)

to illustrate Dr Forbes's Paper on the

Medical Topography

of the

Lands-End District.



Trans. of Provincial Assoc. Vol II. P. 32.

R. Martin, lith. 14 St. Martin's L.

cross-cuts. A mine thus consists of a series of horizontal galleries generally one above the other, but sometimes running parallel, traversed at irregular intervals by vertical shafts, and all communicating together, either directly or indirectly.

A person unacquainted with the details of mining, on hearing of many hundreds of men employed in a single mine, might naturally imagine that a visit to its recesses would afford a picturesque and imposing spectacle of gregarious labour and bustle, tremendous noise, and much artificial brilliancy to cheer the gloom. Nothing, however, is farther from the truth, as far as regards the mines of Cornwall; for, like their fellow-labourers the moles, the miners are solitary in their operations. Seldom do we find more than three or four men in one gallery at a time, where they are seen pursuing the common operations of digging or boring the rock, in the inner extremity of the gallery, by the feeble glimmering of a small candle, with very little noise or bodily movement. Very seldom are they within the sound of each other's operations, except, occasionally, when they hear the dull report of the explosions.

In the vicinity of the main shaft of the mine, indeed, the incessant action of the huge chain of pumps, produces a constant but not very loud noise, while the occasional rattling of the metallic buckets for raising the ore, against the walls of the shaft, as they ascend and descend, relieves, in some degree, the monotony of the scene. Still every thing is dreary, dull, and cheerless; and one can be with difficulty persuaded, even when in the richest and most populous mines, that he is in the centre of such

extensive and important operations. What adds greatly to the impression of tameness, is the extreme darkness and dirtiness of the galleries. There is no light whatever but that afforded by the candles of the workmen, and by those carried by yourself and guide: while the universal presence of water soaking through the crevices of the galleries and intermixing with the dust and rubbish, keeps up a constant succession of dirty puddles; through these the visitor must pass, besides being frequently obliged to crawl on all fours through passages too low to admit him in any other manner. The galleries are extended by breaking down the looser parts by the pickaxe, and by rending the more solid by gunpowder. Each miner has a candle, which is stuck close by him, against the wall of his gallery, by means of a piece of clay; and besides the men employed in extending the gallery, there are generally one or two boys employed in wheeling the broken ore, &c. to the shaft. Each of these boys has also a candle fixed to his wheelbarrow, by the universal subterranean candlestick, a piece of clay. A certain band of men (called, however numerous, *a pair*) generally undertake a certain portion of work in the galleries. These subdivide themselves into smaller bodies, and, by relieving each other at the end of every six or eight hours, keep up the work uninterruptedly, except on Sunday. By means of this subdivision of the pairs, there is, in general, not more than one-third of the underground labourers below at any one time. Notwithstanding this incessant labour, the progress of the miner in excavating his gallery is, in general, very small: one, two, or three feet in a

week, or a few inches daily, is often the whole amount of the united operations of 20 or 30 men. In loose lodes, and in killas districts, they often cut much more than this, but often they do not cut so much. It is to be recollected that the lode is very rarely so wide as the gallery, so that it becomes necessary, in order to continue the latter of the proper size, to hew through the solid rock on each side, which is often very hard, even when the lode is soft. The Cornish miner rarely sleeps or eats under ground, but returns to *grass* (the technical name of the surface) and to his home, often many miles distant, at whatever depth he may be working, when relieved by his successor.* The mode of ascent and descent is by means of vertical ladders fixed in the shafts.

Water of Mines.—Any person who calls to mind the manner, object, and results, of the common process of sinking wells, will be prepared to expect the presence of water in mines. The quantity of this varies very much in different mines at the same time, and in the same mines at different times. Some of the circumstances that occasion this difference are very obvious, for instance, the topographical relations of the surface, the nature of the rock and lode, the number and size of the lodes, cross-courses, &c. Many galleries, both on the lode and through the country, are quite dry, but in general the reverse is true. Commonly the water oozes almost imperceptibly from the lode and walls of the galleries, and

* On extraordinary occasions, a miner, working by contract, and more than usually industrious or avaricious, will remain under ground several days together, having his food and drink brought to him; but this is very uncommon.

gradually accumulates, so as to form puddles and pools, of considerable size, under the feet of the miners; and it is very common to find the bottom of long galleries covered, for some hundred feet, with dirty water of this kind, to the depth of several inches, and sometimes of a foot or more; sometimes, but very rarely, we meet with brisk streamlets or springs gushing from the lode. In most mines we meet with currents of water flowing towards the pumps from the upper galleries, or from parts of the mine that have been abandoned.

The quantity of water in mines is most abundant during the winter, or rather in the spring, some time after the termination of the rainy season. This fact is easily accounted for, especially in deep mines, by the length of time that the superficial water requires to percolate to a considerable depth. Inattention to this circumstance has given rise to an idea, still prevalent among miners, that a dry easterly wind raises the springs. The fact seems to be, as has been satisfactorily shown by Pryce, that the "dry easterly winds," of the spring generally set in, in this country, about the period at which the main body of the rain, fallen in the preceding months, has been able to attain, in its slow progress through the lodes and strata, the bottom of the mines. The variation, in the quantity of water is much more considerable in shallow mines; these soon experiencing the variations of humidity at the surface, according to the seasons. It is a curious fact that several mines worked under the sea, have been found less subject to the percolation of water from above than many others. This was formerly observable

in Huel Cock, in the parish of Saint Just, and is at the present time, in two mines in the same parish, Botallack and Little Bounds.

For keeping the workings from being inundated, each mine is furnished with a chain of pumps, extending from the bottom to the adit level, worked by a single pump-rod, each pump receiving the water brought up by the one immediately below it. All the water of the lowest level finds its way into the bottom of the mine, or *sump;* the water from the upper levels is received into cisterns placed in different parts of the shaft, at the termination of each tier of pumps, from whence it is drawn to the *adit,* through which it flows outwards to the surface of the earth. The quantity of water discharged by the pumps, by many of the Cornish mines, is very considerable: thus, in 1819, Huel Abraham, 1440 feet in depth, discharged about 2,092,320 gallons every twenty-four hours; Dolcoath, of nearly the same depth, 535,173 gallons in the same time; and Huel Vor, 950 feet deep, 1,692,660 gallons.*

Temperature.—It results from the experience of all those who have practically investigated the subject, that the temperature of the air, earth and water of mines, at a certain depth under the surface, is very considerably greater than that of the mean of the climate of the district. It has also been universally found that the temperature increases with the depth. Both these facts I have myself ascertained, by many trials, in the mines of Cornwall, beyond the

* Memoir on the Temperature of Mines, in the second vol. of the Transactions of the Royal Geological Society of Cornwall. By John Forbes, M. D.

possibility of doubt, and they must, therefore, be admitted as such, however inexplicable, or however at variance with our theories or preconceived opinions.

In the memoir from which some of the foregoing details are extracted, I have further proved that by far the greater part of the superior temperature of mines is derived from the rocky mass of the earth, and does not arise from any extraneous or artificial causes. This, however, is a matter of little consequence to the subject of our present enquiries, since the degree of temperature will act similarly on the animal bodies exposed to it, whether arising from natural or artificial causes. The degree of temperature varies considerably in different mines at the same depth; but this variation seems fairly attributable to the state of ventilation and other extraneous causes, and not to any difference of the natural heat. The increase of temperature does not begin immediately below the surface; a fact which is sufficiently proved by the copious permanent springs in every country, which remain invariably of the mean temperature of the climate. This fact holds equally true in Cornwall, not only in the vicinity of mines, but in the shallower levels of mines themselves. At what precise point below the surface the augmentation of temperature commences, I am unable to say with any degree of confidence; but from a consideration of the influence of extraneous causes in modifying the temperature of the superior galleries of mines, and from some particular observations made by myself, I am disposed to place this point at about 200 feet below the surface. From this point

the temperature is found to increase about one degree of Farenheit for every 50 or 60 feet that we descend. The following table, constructed from my journals of many painful visits to some of the Cornish mines, gives, at one view, the temperature of the air and water* of six mines of this district; and the mean of the whole, given in the last column, may be considered as a correct statement of the temperature of the subterranean climate of the miner, at the various depths at which he works.

Mean Results of the Temperature of Six Mines.

Depth in Feet.	Huel Neptune.		Botallack.		Little Bounds.		Ding Dong.		Huel Vor.		Dolcoath.		Mean.	
	A.	W.	A.	W.	A.	W.	A.	W.	A.	W.	A.	W.	A.	W.
120 to 150	57	...	59	57	...	...	55	..	...	...	...	...	57	57
150— 200	56	...	60	58	54	54	...	. .	...	..	...	...	57	56
200— 250	56	...	61	...	57	55	...	...	60	57	...	...	58	56
250— 300	56	55	61	59	57	59	...	...	...	...	60	...	58	58
300— 350	58	54	...	...	55	55	...	...	...	...	...	...	57	55
350— 400	...	57	66	62	...	...	55	...	...	...	...	...	60	59
400— 450	60	...	66	...	...	...	56	54	...	...	...	...	61	54
450— 500	...	...	...	...	...	...	60	55	...	...	...	...	60	59
500— 550	67	67	67	68	...	...	...	...	61	60	64	...	65	65
550— 600	...	...	...	...	...	...	63	63	..	...	...	...	63	63
600— 650	...	...	...	...	...	...	62	63	61	63	...	...	62	63
650— 700	...	...	...	...	...	...	64	64	65	64	...	...	65	64
700— 750	...	...	...	...	...	...	..	...	67	65	...	...	67	65
750— 800	...	...	...	...	...	...	...	...	68	68	...	...	68	68
800— 850	...	...	...	...	...	...	...	...	66	66	...	...	66	66
850— 900	...	...	...	...	...	...	...	...	...	68	...	...	...	68
900— 950	...	...	...	...	...	...	...	...	...	71	62	...	†62	71
950—1150	...	...	...	...	...	...	...	...	...	...	70	66	70	66
1150—1260	...	...	...	...	...	...	...	...	...	...	71	71	71	71
1260—1350	...	...	...	...	...	...	...	...	...	...	76	74	76	74
1350—1400	...	...	...	...	...	...	...	...	...	...	83	79	83	79

Ventilation.—The existence of this temperature at the bottom of mines, (however produced) will, of itself, necessarily occasion a constant circulation of air upwards, through the shafts; and as what ascends must be replaced by the air above, there will, of

* Marked, respectively, in the Table, A. and W.

† Here there was a strong current of air.

course, be a constant current downwards through the same or other shafts. The extent of ventilation in mines will depend on many circumstances, more especially on their depth, the number of shafts, the degree of communication between the different galleries, and also on the state of the wind at the surface. The cooling effect of high winds is very perceptible even at the bottom of shallow mines, and it appears that the currents of air in the very deepest mines are considerably influenced by their force and direction.

Though these currents in the shafts and more open galleries are considerable, it is still true, that in the great majority of the galleries no current, or one that is very slight, is perceptible; and that in all such galleries as communicate only by one extremity with a shaft, or with other levels by a *wins* at some distance from their inner extremity, (both of which kinds constitute the greater number of the working galleries,) there is no current whatever, and, in fact, no possibility of there being one. Many of these galleries are several hundred feet in length, with no other outlet but their extremity at the shaft. A sufficient proof of the general stillness of the air in mines, is afforded by the fact of lanterns being unknown in them; and during all my visits to these gloomy regions, I never saw the candle extinguished by a current of air, more than once or twice.

State of the air in mines.—The preceding details sufficiently point out the high temperature and great humidity of the air in mines. Many causes combine to render it also very impure, but particularly the following:—1st, the mechanical admixture of parti-

cles of dust; 2nd, the admixture of irrespirable gases produced by the explosion of gunpowder; and 3rd, its deterioration by respiration and combustion

All the various labours of the miner tend to impregnate the air with minute earthy particles, and this impregnation is rendered much greater than it could otherwise be, by the great stagnation of the air in the extremities of the galleries, where these labours are chiefly performed. The kind and quantity of dust varies according to the nature of the rock and vein, the degree of humidity, and also according to the process by which the rock and ore are broken up. The constant presence of dust is sufficiently obvious to any one who visits the interior of a mine in a state of activity. I cannot say, however, that I was ever sensible of its presence from any immediate effects on the organs of respiration. Its prevalence is abundantly obvious in the smutty ochry complexions and dresses of the miner, or of the visitor of mines, in the dusty floors of such galleries as are perfectly dry, and in the layers of soft mud and turbid puddles that cover the bottom of all those which contain much humidity. A still more striking proof of the prevalence of this dust, and an instance more important to the subject of this essay, is the fact, confirmed to me by the testimony of many labouring miners, of the *sputa* being tinged by it for many hours after the miner leaves the mine, and of this tinge being varied in colour according to the nature of the rock and vein worked.

Except in those mines which are situated in soft slaty rocks, and whose lodes are also of a soft kind, (a very small proportion,) the use of gunpowder for

blasting the rock, is universal in the Cornish mines. Indeed in all the mines situated in granite, almost the whole excavation of the galleries and shafts is effected by this agent. The operation is precisely the same as in quarries at the surface.

When the hole is charged and the match lighted, the operator and his immediate neighbours retire to a little distance until the explosion takes place, when they return almost immediately to remove the fragments and to resume their former labours in the inner extremity of the gallery, still filled with smoke and the sulphury vapours of the exploded powder. This operation is repeated in the same gallery, generally many times daily, insomuch that the sight and smell of the smoke is rarely not to be perceived, in some degree or other, throughout the whole period of excavating a gallery in a *hard country*. The extent of this practice in mining will be understood from the quantity of gunpowder consumed. In the six mines, the temperature of which is given above, and the far greater part of which are situated in the comparatively soft rock killas, the expenditure of gunpowder per month, in 1820, was 8,810 lbs.; the number of men employed underground being 2323. Each charge consists of from $\frac{1}{4}$ to $\frac{1}{2}$ lb. of gunpowder. No means are taken to expel the smoke and irrespirable gases produced, which are left to find their way slowly to the outer extremity of the galleries and the shaft. They are certainly very offensive to the lungs, especially soon after an explosion, as I can myself testify from experience. The coloration of the sputa, from these fumes, is still more general and certain than from the inhalation of dust, and is

readily distinguished from the latter by its black colour. Besides the more sensible effects on the air of mines by the explosion of gunpowder, it must deteriorate it, in a still greater degree, by introducing so large a quantity of irrespirable gases into it. The gases generated by the explosion of gunpowder are carbonic acid gas, azote, sulphurous acid gas, and, perhaps, sulphureted hydrogen.* These are all injurious to respiration, inasmuch as they are all either hurtful stimuli to the air passages, or are destitute of oxygen, or possess both these qualities combined.

Their amount is very considerable, estimated relatively with the spaces in which they are generated. It has been ascertained by experiment, that the gases occupy 244 times the volume of the powder from which they are extricated, supposing them to be, when evolved, of the same density as the atmospheric air. Allowing for the expansive effect of the heat generated at the time of explosion, it has been calculated that they will occupy 1000 times the space occupied by the original powder. Now, admitting a pint of gunpowder to weigh somewhat more than 14 oz. and allowing 60 pints to the cubic foot, we have thus 1000 cubic feet of gas for 50 lbs. of gunpowder, or 20 cubic feet for 1 lb. taking into account the effect of rarefaction. This will give 176,200 cubic feet of irrespirable gases generated per month, in the six mines above mentioned.

The air of mines is still further deteriorated by the consumption of oxygen, and the generation of

* The following products, and the annexed proportions, I find stated by authors:—Air 1,000, carbonic acid 1,549, azote 969, sulphureted hydrogen 1,191, sulphurous acid gas 2,193.

carbonic acid gas, in the processes of respiration and combustion.

It results from the nature of the process of excavating the galleries, that almost all the contaminating influences exist in those very places where their powers must be greatest and most sensibly felt, viz. in the inner extremities of the galleries, where the air is stagnant, and where the miners pass nearly all the time they remain under-ground. This circumstance, it is obvious, will give an importance to this class of causes, which the mere amount of their deteriorating powers would by no means entitle them to, in any other situation. The effect of the respiration of the miners may be judged of, from considering the number of men employed.

The effect of combustion in contaminating the air, is equally well understood. The extent of this cause of deterioration of the air of the mines of the Landsend district, may be estimated by the quantities of candles consumed, the only species of combustion, besides gunpowder, used in mining. In the six mines formerly mentioned, the expenditure of candles in 1820, was 22,140 lbs. per month.

I know of no eudiometrical experiments that have been made on the air of mines, and I regret that I have myself none to record in this place; I think, however, the foregoing observations render it certain that this must be, in a considerable degree, impure, as well from the abstraction of its oxygen, as by the addition of substances, mechanical and gaseous, which are not merely useless, but positively injurious to the functions of animal life.

Owing to the absence of the generating materials in the mines of Cornwall, the hydrogenous gases of coal mines are entirely unknown. Accidents, however, occasionally, though very rarely, occur, from the accumulation of other of the irrespirable gases in long abandoned galleries; and it is very common in sinking deep shafts, or driving long galleries, to find the air so vitiated by respiration and combustion, and by the gases from exploded gunpowder, as to oblige the miner to fix his candle in almost a horizontal direction, to keep it from being extinguished. In cases of this kind artificial currents are, occasionally, produced by means of air pipes, &c.

In considering all the circumstances which can, in any way, affect the health of miners, we ought, perhaps, not altogether to overlook the fact of their subterranean labours being all performed in a very feeble light, a circumstance which forms a very striking contrast with the artificial glare of many of our manufactories, more particularly since the use of gas lights has become common.

Labours and habits of miners.—Setting aside the unwholesome nature of the occupation, I do not consider the labour of the miner as by any means severe; it is certainly much less severe than that of the stone-quarrier or mason. In respect, however, of injurious influence on the integrity of the animal frame, there are few kinds of bodily labour that can be compared with it. The subterranean labours of the miner commence at the early age of from eight to ten. At first, and for several years, the young miners are employed principally in conveying in wheelbarrows the ore and broken rock from the inner

extremity of the galleries to the nearest shaft. In this employment they enjoy a much purer air, and a much less constrained posture than will be their portion when they are a few years older. The occupation of the common miner, as formerly mentioned, consists essentially in breaking down the metalliferous vein or lode, and the surface of the bounding rock on either side, by means of the pick-axe and lever, and the more powerful arm of gunpowder. Where the lode and rock are not very hard, and can be excavated by the former, these only are used. This, however, is rare even in the killas districts, for any considerable extent; and the fact certainly is that, whether from the hardness of a part, or a whole rock or vein, or from the greater expedition of the process, by much the greatest portion of the galleries in the mines of Cornwall, is excavated by means of blasting with gunpowder. The process followed is the same as that adopted by the common quarrier. Holes are driven, occasionally, on every face of the gallery, above, below, and on either side, but much less frequently in the first of these directions. Generally, during the process of boring, the operator is seated; occasionally he is obliged to stand either completely or partially erect. When the gunpowder is deposited in the bottom of the hole, the upper portion of this is rammed full of fragments of rock, ore, or clay, by means of a metallic cylinder. This process of confining the powder is called *tamping*, and the cylinder, a *tamping-bar*. During its performance the gunpowder is occasionally ignited, and the operator killed or severely wounded by the explosion.

The cause of these premature explosions was clearly investigated and keenly discussed, some years since, by several members of the Cornwall Geological Society, and an ingenious paper on the subject was written by the then secretary, Dr. Paris. He considered the ignition as invariably taking place by the sparks produced by the collision of the *tamping bars* (which, at that time, were generally made of iron), and the stony materials in contact with the powder, and proposed, as an infallible preventive, an alloy bar of tin and copper, which is incapable, under ordinary circumstances, of striking fire with stone. In the same essay, an improved mode of conveying the powder to the bottom of the hole was proposed. Both of these suggestions have been only very partially adopted, and their value, as preventives, has been very differently estimated by different practical men. A greater improvement than either of these has been adopted, of late years, in many mines, namely, the employment of soft tamping-stuff, incapable of yielding sparks on percussion.

With these various alterations, and with an increased degree of care and attention on the part of the superintendents, awakened and confirmed by the discussions above alluded to, the fact assuredly is, that accidents, from this cause, are much rarer of late years in the mines in this district.

The ordinary period of under-ground labour is six hours in the twenty-four; at the end of this time the labour is assumed by a fresh band from the surface, (or *from grass,* as the miners term it), who are, in their turn, relieved at the end of a like period. The dress of a miner, under-ground, consists of a coarse

flannel shirt and drawers, and a pair of coarse linen trowsers, a low round-crowned hat, and a pair of shoes. At the end of the period of labour, on the workman's return to the surface, some part of the dress is generally changed, the hands and face washed of their ochry covering, and a coat and waistcoat put on. Miners frequently live several miles distant from the mine in which they work, and invariably return home on leaving it. While at work, miners in general perspire very freely, owing to the very high temperature of the stagnant air in the inner ends of the galleries.

Sometimes the galleries wherein the men are working are quite dry and dusty; much more frequently the bottom is covered with a greater or less portion of water, produced by the imperceptible transpiration of the vein or condensation of the humid air; and, occasionally, in lodes of a very loose texture and in a watery country, the whole roof of the gallery is perceptibly dripping. In all the lower galleries of Huel Vor tin mine, which is situated in killas, I found the water pouring from the roofs like rain, and in some places rushing in streams through the loose and *drusy* lode. In all these galleries the average temperature of the water, at a depth of 800 feet, was about 67°.

The miners whom I saw at work here, had been drenched in this incessant shower six hours every day, for many preceding months.

Miners never carry any food with them into the mines, and I never observed any other kind of drink than water. They never sleep under-ground, nor

did I ever, during my visits, find them resting from their labours.

The descent and ascent into and from mines, are through the shafts, by means of perpendicular ladders, and constitute a very important feature of the labours of this class of men. The labour of ascent is, to a stranger, very severe, producing, in a very short time, great breathlessness, palpitation, and exhaustion. It is accomplished by grasping the steps above you, with an alternate change of the hands, and, as it were, drawing up the lower parts of the body: it is going on all fours up a perpendicular plane. Habit makes the labour comparatively easy to the miner, and the younger ones often make trial of their respective activity in coming to grass. Several miners have accused this practice as the primary cause of their asthmatic sufferings in after life. When the mine is of any considerable depth, it hardly ever happens that the train of ladders is in one continuous chain from top to bottom; on the contrary, after ascending two or three, it is, commonly, necessary to traverse a greater or less extent of a horizontal gallery, in order to reach the next series of ladders. This gives time for breathing, although it adds to the length of the journey; for as almost all galleries are horizontal, every foot of positive ascent must be by ladders, which are almost always perpendicular. In very deep mines, this makes the labour of ascent a very serious matter, when taken daily for years. Unfortunately for the miner, most of the richest and populous mines are the deepest, and most worked in their lowest regions. When I visited Dolcoath copper mine in 1819, the lowest gallery was 1386

feet deep; and Huel Abraham, in 1822, was 1440; the former employed 800, and the latter 560 men in the under-ground labours. From the account formerly given of the *ventilation* in mines, it is evident that the miner, in returning from his work, must be frequently exposed to strong or partial currents of air.

Domestic Economy. A. *Houses*—There is, generally, an intimate connection between the construction of the houses and the physical structure of a district, or between its architecture and geology. And this connection is most perceptible in the habitations of the poor. Wealth can transport from a distance the materials of the castle or mansion, but poverty must be content to rear the cottage from the adjoining pit or quarry. The excellent granite and porphyry of this district afford the finest materials for building, and give to the churches and gentlemen's houses a most substantial and beautiful character. Many of the cottages are built of the same materials, but the greater proportion are constructed of clay and straw closely intermixed. This material is adopted by the poor in preference to stone, from the expence of quarrying the latter. The cottages so constructed are generally very warm and dry. They are commonly roofed with straw. Less neat in their exterior, they are also less clean and comfortable in their interior economy than the cottages of most other counties in England.

Like the Scotch and Irish cabins, they have hardly any flowers or shrubs about them, and very commonly the dunghill is near the door. They, however, almost invariably possess a small potatoe garden near them; the potatoe here, as in Ireland and Scot-

land, being cultivated as the staple article of the peasant's food. In the poorest cottages there are always two apartments; but it is customary for all the members of the same family to sleep in the same room. Bedsteads and bed-clothes are possessed by all. In Penzance, and the other small towns of the district, where space is precious, many individuals are often crowded into one house, and want, in all its forms, want of furniture, clothing, cleanliness and air, consequently becomes very conspicuous. This observation especially applies to Penzance and Newlyn. The cottages have always inclosed chimneys, and are not particularly smoky.

B. *Fuel.*—Fuel is rather a scarce commodity in this district. That commonly used by the labouring classes in the country, consists of coarse spongy turf, shaved from the scanty covering of the granite moors, together with heath and dried furze from the same places. The almost total absence of wood renders it, as an article of fuel, quite unknown, and coals are almost entirely confined to the towns and houses of the better classes. There is hardly any of the true *peat* of Scotland and Ireland to be found in the district.

C. *Dress.*—The dress of the common people is not at all peculiar. Except when oppressed by poverty, they are, in general, sufficiently well clothed. Fishermen are here, as elsewhere, remarkable for the warmth of their clothes. The miners, when above ground, wear the common dress of the peasantry, only tinged with the ochry livery of their tribe.

D. *Diet.*—The great importance of this, in an enquiry respecting the sources of health and disease in a community, will be generally admitted, and renders a somewhat closer examination of the subject necessary. In this district, as in most others, the kind of food in general among the common people, has been determined by the nature of their habits and pursuits, and by the species of aliment of which their locality is most productive. We find, accordingly, that the inhabitants of this district are as much indebted to the sea as to the land for sustenance. Fish, pork, potatoes, and barley bread, compose the general stock of provisions. In plentiful seasons, in summer, the pilchard, in its fresh state, with potatoes, is the main article of diet; in winter and spring, the same fish, salted, with potatoes, is still the staple and standing diet of the labouring classes of the district. In most cases, indeed, the salted pilchard may rather be considered as a sort of *sauce* (scottice *kitchen*) for the accompanying mess of potatoes, than as a substantial article of diet, as it bears but a very small proportion, both in size and actual nutriment, to the latter; still its presence is necessary, and is deemed most essential. The fish and potatoes are boiled together. This, together with barley bread, may be considered as the general *dinner* of the peasantry, miners, and fishermen, throughout the year, although, as has been already observed, the same fish in its fresh state, and, also, mackerel and other fishes, and, occasionally, salted pork, take the place of the salted pilchard, as accompaniments to the unfailing potatoe. The same dish, or some variety of the same, especially as to

the proportion of the barley bread, composes the *supper*. The breakfast is, occasionally, similar also; but it now much more commonly consists of tea and bread and butter. The use of tea may now be considered as universal. As may be inferred from its high price, the infusion of it, in use among the poorer members of this community, is extremely weak, being, in fact, little better than warm water. The poorer individuals drink this often without either sugar, treacle, or milk.

In the towns the use of wheaten bread is becoming more general, even among the poorer classes; but in the country parishes, barley bread is the only kind in common use. This is also of a very bad quality. The coarse barley meal is baked in large loaves, which are seldom sufficiently cooked, so that the bread is generally extremely coarse, black and sour, and more like wet dough than bread. It is baked by being placed under an inverted brass pan, which is covered with burning furze, and in its characters bears ample proof of the rudeness and insufficiency of the process. Fresh animal food, under the form of butcher's meat, is rarely known to the labouring classes, except in towns, where an occasional meal of it is seen, as well as wheaten bread. Milk is also in use more or less, but is by no means an extensive article of diet. Scarcely any kinds of vegetables, but potatoes, are used by the common people, and are rarely to be seen in their little gardens. All species of green vegetables and fruits are entirely unknown to them as articles of food. Upon the whole, I should say that the principal articles of diet of the common people, are salted pilchards, potatoes, and

barley bread, with tea; and of these I think that the breakfast of weak tea and ill-baked barley bread, is both disagreeable and unwholesome.

Among the greater half of the inhabitants of this district, i. e. the poorer class, beer can hardly be reckoned as an article of diet. Many families, even among the labouring classes, doubtless, use it as such; all indulge in it, occasionally, as a luxury, yet its daily and habitual use is entirely unknown to the greater part of this class of people in the district.

This naturally leads to the subject of *drinking*, more particularly so called, or the use and abuse of spirituous and other strong liquors. And I am happy to say that, in this respect, I can make a most favourable report of the inhabitants of the Landsend, although I am not sure that their temperance is not, in a considerable degree, constrained. At least the report made of them in this particular, only a few years back, by one of their native historians, is extremely different from the representation of their present temperance, which my experience enables me to give.

"There is another poison among us," says Polwhele, "more deleterious than all the lead that ever existed in the cider vessels of Devonshire and Cornwall. The ardent spirits to which the Cornish vulgar are habituated, 'young men and maidens,' old men and children,—pueri innuptœque puellæ, are unquestionably prejudicial to health, and are often attended with fatality." And in another place, "Among miners and others, spirituous liquors are equally in repute." (p. 107.) The same complaint is made by Dr. Borlase, in 1758, and the causes are

said to be, the nature of the principal occupation, (mining), and the frequent and numerous elections in the boroughs for members of parliament.

The case is certainly very different at present, both among the mining and the agricultural population. Both of these classes of people must now be considered as habitually sober, although they, unquestionably, occasionally commit excesses in this particular. Two causes appear to have combined to produce this very desirable and beneficial change in the habits of the labouring classes in this district; the suppression of foreign smuggling, and the general prevalence of Methodism. For a good many years past, almost all the miners have been strict followers of the Wesleyan professors, and in place of spending their Sundays in the ale-house, have spent them in the laborious duties of the conventicle; while, during the same period, hardly any foreign spirits have found their way into the district.

E. *Employments, Amusements, &c.*—The principal peculiarities in the occupations of the miners, have been already mentioned; among the remaining classes of the people, there is little deserving notice under this head.

The fisherwomen are accustomed to carry on their backs, very heavy loads of fish, in baskets called *cowals*, the anterior strap of which is supported across the forehead. The same class of people have also an odd mode of carrying sand, in bags laid across the loins, and which are retained in their place partly by the hand stretched backwards, and partly by the inclination of the body forwards.

As there is no species of domestic occupation, such as spinning, knitting, &c. to which the females of the class of peasantry can apply themselves, they are much employed in the labours of the field; and, indeed, these, and the cares of the dairy, constitute their whole employment. They are all excellent equestrians, a circumstance arising from the comparatively rare use of carts to convey the productions of the farm to the weekly markets. Hundreds of women may be seen, on a market day, riding, often at full speed, with their baskets, and supported only by their own skill of equipoise, on a pad, without stirrup, and only with a common halter.

There are a few peculiar customs still prevalent among the people, which it is proper to notice in this place, without, however, entering into any detail. Of this kind are the rustic festivals known by the name of saint, church, or parish *feasts*, which, like most of the ancient *fetes*, now exist in very degenerate splendour. "The saint's feast is kept," to use the words of Carew, "upon the dedication day, by every householder of the parish, within his own doors, each entertaining such foreign acquaintance as will not fail, when their like turn cometh about, to requite him with the like kindness."

The *fete* is kept up, for two or three days, with more or less spirit, and an adjournment is always made to the village ale-house, where dancing and drinking are more liberally enjoyed than at home. On these occasions the men are, as might be expected, often intoxicated. The ancient festivals called *church ales*, usually held on the whitsuntide holidays, are now entirely obsolete in this district. This is also true of the rude plays or mysteries called

the guary miracle. A very singular custom prevails at Penzance, of raising bonfires in the streets on Saint Peter's eve, on which occasion the common people traverse the streets all the fore part of the night, swinging huge burning torches round their heads. This is one of those ancient customs still persevered in, after its object and intention, and even the meaning of it, have become quite obsolete. Among the amusements of the common people, *wrestling* deserves mention, as being still in frequent use.

Moral and intellectual condition.—In former times the miners of Cornwall were generally considered, and I apprehend not without reason, as remarkably rude, turbulent, and irreligious. The case is now, however, very different. It has been already mentioned that intemperance in drinking is very little known; and if we may judge from the almost universal prevalence of Methodism in the district, and the fidelity and zeal with which all its observances are followed by the common people, we must consider them as being very religious. Bastardy, however, seems to be, as yet, beyond the control of this agent, as I have reason to believe that, in many country parishes, the majority of women are in an advanced state of pregnancy when married. Indeed it is understood to be a common case among the lower orders, that cohabitation shall take place, without any other bond than an understanding that marriage shall ensue upon the supervention of the state above mentioned.

If we may judge from the great number of men of talent, natives of this district, who have distinguished themselves in literature, science, and the

arts, we ought to rate the intellectual capacity of the inhabitants of the Landsend very high. The two last Presidents of the Royal Society, Sir Humphry Davy and Davies Gilbert, Esq. were born within five miles of each other, in this district; and many other individuals might be named, both of the past and present times, sprung from different classes of the community, whose talents have illustrated their native Penwith. It is a circumstance well worthy of remark, how much the intellectual capacity, or rather the intellectual development of the people, varies in the different classes. Generally speaking, the common peasantry or agricultural labourers, are as heavy, dull, and unintellectual, as in any part of England, while the miners, the common labouring miners, are singularly acute and intelligent. The causes of this difference are sufficiently obvious, and lie in the nature of the avocations of the respective parties. The peasant, from youth to age, plods round the same dull circumscribed circle of occupation; and his business being fully learnt in early life, makes no great demand on the maturer powers of succeeding years; while the miner, with labours fraught with all the interest of variety, novelty and speculation, and requiring the constant exercise of his judgment to decide on doubtful points, lives in a constant state of intellectual training. The consequence is as above described.

PART II.—STATISTICAL AND MEDICAL.

CHAP. I.—STATISTICAL HISTORY OF THE INHABITANTS.

Physical character of the People.—The Cornish, like the Welsh and Scotch, and I believe justly, lay

claim to a more ancient and more unmixed descent than their neighbours of the interior of the island; yet I must be allowed to express my doubts whether they exhibit, in their persons and character, any thing obviously peculiar. They seem to me of middle size and strength. Polwhele says, "they exceed not, in general, the middle size. I should rather, indeed, say that they are short and thick, with legs perhaps too slight for their bodies. But, after all, they have more strength and activity than their eastern neighbours. It was observed of the regiment of Cornish Militia, when at Chatham Camp, in the time of Colonel Molesworth, that they stood on more ground than any other militia of the same number of men. This was attributed to the breadth of their shoulders, which, in comparison with the eastern men, was uncommonly striking."

This latter circumstance, which is certainly very remarkable, Mr. Polwhele attributes to the constant use of the pickaxe, or bidaxe by the Cornish peasants. "Where a man of York or Kent," says he, "would employ a shovel or a spade, a Cornish man uses a bidaxe. And, doubtless, the action that accompanies the strokes of the bidaxe must, like the ringing of bells, open the chest;" p. 31. The strength and activity of the Cornish peasantry are still further evinced, and, perhaps, produced, by an adherence to several of the athletic exercises more general in former times. The principal of these is wrestling, which is still much followed in this district.

Population.—This district is extremely populous, more so, probably, than any district of the kingdom not containing larger or more numerous towns. The number of inhabitants by the census in 1821,

was, as has been already mentioned, 60,642, while the number of statute acres constituting the district, is 90,957, or 142 square miles. Now, it appears from the parliamentary returns for 1821, that the proportion of inhabitants to the square mile in all England and Wales, was 210 in that year, while in all Cornwall it was only 194, and in the agricultural county of Sussex only 162; but the foregoing statement gives for the Hundred of Penwith 427 persons to each square mile. That this great superiority does not depend on the populousness of the towns, is very certain, as we find that it is still maintained in a very considerable degree, after deducting *the whole* of their inhabitants. Thus, if we deduct one-fifth of the whole population, (12,128) we have still a proportion of 341 inhabitants to every square mile. This very great populousness is occasioned principally by the great proportion of persons employed in the mines, which, in this point of view, may be considered as subterranean factories Is it, also, partly owing to the smallness of the farms, and to the universal habit of very early marriages? The existence of small farms, which necessarily produce many *masters*, and a comparatively small number of *servants*, would seem almost necessarily to conduce to frequent marriages.

The number of inhabitants in this district, in the four decennial periods since the commencement of the present century, was as follows:—

In 1801,.....	43,226
1811,.....	50,263
1821,.....	60,642
1831,.....	72,402

This gives an increase of 41 per cent. in the whole 30 years, which is considerably above the average

increase of the county of Cornwall, and of the whole of England, during the same period; the former exhibiting an increase of 37 per cent. and the latter of 34 per cent. only.

The rate of increase has differed considerably among the different classes of inhabitants, being a good deal more among the mining population than among the inhabitants of agricultural parishes and towns.

We are enabled to ascertain this fact from various sources, but with most accuracy, 1st, by comparing together the population of the chief mining parishes with that of the agricultural districts and towns, as in Table I.; and 2nd, by comparing the number of men liable to serve in the two classes of militia, (mentioned in the last chapter,) as in Table II.

From the first of these documents it results that the mining population has increased 40 per cent. while the agricultural has increased only 38 per per cent. during a period of thirty years.

From the second of these documents it results that the mining population has increased 33 per cent. while the agricultural has increased only 19 per cent. during a period of fifteen years. This gives the proportional increase of the mining population greatly higher than the former.

The difference of result in these two cases, as to the actual and relative increase in the two classes, flows naturally from the difference of the data on which they are founded. The former document includes the whole population, male and female, for a period of thirty years; the latter, only the actual miners of the male sex, from the age of eighteen to forty-five, and for a period of only fifteen years. It

will be observed, however, that they both concur in proving the greater proportional increase of the mining population; and it cannot be doubted that the ratio of the increase exhibited by the militia returns, comes much nearer the truth than that derived from the parliamentary returns.

TABLE I.—Population of the Hundred of Penwith during the present Century, showing the rate of Increase in each Parish, and in the Mining and Agricultural Districts respectively.

PARISHES.	Population in			
	1801	1811	1821	1831
I.—Mining Parishes.				
Camborne,	4811	4714	6219	7699
Crowan,	2587	3021	3973	4332
Gwinear,	1654	1952	2383	2728
Illogan,	2895	4078	5170	6072
Redruth,	4924	5903	6607	8191
St. Just,	2779	3057	3666	4667
Perran,	506	626	786	1033
St. Hilary,	990	1248	1558	1728
Towednack,	465	532	582	737
Total,	21611	25131	30944	37187
II.—Agricultural Parishes.				
Ludgvan,	1324	1431	1839	2322
Town of Marazion.	1009	1022	1253	1393
St. Michael's Mount,	——	125	223	161
St. Ives,	2714	3281	3526	4776
Buryan,	1161	1188	1495	1707
Gulval,	1076	1224	1353	1467
St. Levan,	400	434	490	515
Gwithian,	329	372	472	539
St. Erth,	1122	1317	1604	1922
Madron,	1564	1817	2011	2058
Town of Penzance,	3382	4022	5224	6563
St. Paul, including fishing villages	2937	3371	3790	4191
Sancred,	782	790	1001	1069
Sennen,	431	495	637	689
Zennor,	544	671	715	811
Lelant,	1083	1180	1271	1602
Morvah,	282	273	325	377
Phillack,	1475	2119	2529	3053
Total Agricultural Parishes,	21615	25132	29698	35215
Total Mining Parishes,	21611	25131	30944	37187
Grand Total,	43226	50263	60642	72402

TABLE II.—Number of Men liable to serve in the Miners' and Cornwall Militia, with the Rate of Increase in different periods.

Years.	*Cornwall Militia.*	*Miners' Militia.*
1798		1275
1808	3086	2128
1818	3305	2680
1822	3817	3195

TABLE III.—Total Marriages, Births and Deaths, in the Hundred of Penwith.

Years.	*Marriages*	Baptisms.			Deaths.		
		Males.	*Females.*	*Both.*	*Males.*	*Females.*	*Both.*
1801	288	636	611	1247	330	320	650
1811	327	880	802	1682	436	397	833
1820	438	1060	1029	2089	427	439	866
Total in 20 years, from 1801 to 1820,...	7495	17941	17198	35139	8349	8324	16673

TABLE IV.—Proportion of the Sexes at all ages.

	In England and Wales.		In Penwith.	
	Males.	*Females.*	*Males.*	*Females.*
1811	100	110	100	111
1821	100	106	100	108
Mean	100	108	100	$109\frac{1}{2}$

TABLE V.—Proportion of Sexes Born.

	In England and Wales.		In Penwith.	
	Males.	*Females.*	*Males.*	*Females.*
From 1800 to 1811	100	96	100	93
1811 to 1821	100	95	100	95
Mean	100	$95\frac{1}{2}$	100	94

TABLE VI.—Proportion of Marriages to the Population.

	In England and Wales.	In Cornwall.	In Penwith.
1811	1 in 122	1 in 141	1 in 149
1821	1 in 134	1 in 151	1 in 133

TABLE VII.—Proportions of Births (Baptisms) to the Population.

	In England and Wales.	In Cornwall.	In Penwith.
1811	1 to 34	1 to 32	1 to 30
1821	1 to 35	1 to 34	1 to 28
Mean	1 to 34.5	1 to 33	1 to 29

The proportion of sexes born in this district, as shown by Table V. is, as might be expected, nearly the same as in the rest of England. The greater proportion of females to males, alive at all ages, in this district, is readily accounted for by the influence of mining in diminishing the male population, as will be more fully explained hereafter.

Table VII. shows, in a striking manner, the great proportion of births in this district; and when compared with Table VI. seems to demonstrate the great prevalence of bastardy.

Of the Law of Mortality in the Landsend District, and more particularly of the relative Longevity of the inhabitants.

"The Hundred of Penwith," says Dr. Borlase, "has always been celebrated beyond other parts of Cornwall, for the long lives of its natives." If this be the case, arguing from the data furnished by the different writers on the county generally, the longevity of the inhabitants of this district must, indeed, be very uncommon. It is, however, necessary to remark that, in estimating the general longevity of the population of any place, we are not to be contented by adducing, as has been too often done, instances of extreme old age at different and perhaps distant periods. There is, perhaps, no country in the world, even including the most unhealthy, whose

annals do not contain examples of individuals living to an age much beyond the general mean of the duration of human life. And, indeed, did we trust to such records, we might be inclined to consider almost every country or district, which can boast its native topographers, as pre-eminent in this all-estimable character of longevity. On this account, although I do not mean to overlook the many particular instances of long life preserved in the writings of the Cornish authorities, I still lay much more stress on the results of those records which exhibit the general rate and law of mortality of a whole district during a certain period of time.

"For health," says Carew, in his Survey of Cornwall, "80 and 90 years of age is ordinary in every place; and in most persons, accompanied with an able use of the body and his senses;" p. 177. And he proceeds to record the names of three individuals who died within his own knowledge, whose respective ages were 130, 112, and 106. "They live in this countrie verie long," says Norden, "80, 90, some 100 and more years."* Dr. Borlase records an instance of a woman dying in the parish of Gwithian, in the year 1676, at the age of 164, and also two others of the ages of 120 and 107. Mr. Polwhele, in addition to these, gives us a great number of instances of extreme longevity in different parts of the country. Among these are found one of 150, of 144, of 117, and 116 respectively; three of 107, and fourteen between that age and a hundred. In the Hundred of Penwith he records many instances of longevity, and relates the history of a certain maiden

* Speculi Britanniæ Pars. p. 28.

by name Zenobia Baragwannith, who had not long before, appeared at her landlord's court, to deliver up a farm which she had held on the usual lease of 99 years, all of which had expired during her own possession Miss B. expressed herself anxious to have her audience over, giving, as a reason, that "*she was riding a young beast,*" i. e. a colt not thoroughly broke in, and, therefore, probably not a very patient waiter at the great man's gate. Several other instances are recorded of ages above 100 ; and in the parish of Buryan, (where there are no mines, and of which the population, in 1800, was 1161,) he mentions that there were living, in the year 1785, three persons (men) upwards of 90 years old, and thirteen men upwards of 80, besides old women, "who," adds the reporter, "never die."

I shall now proceed to put the truth of these partial statements and general opinions to the test, by exhibiting, in documents, the authenticity of which cannot be questioned, the actual ages at which the inhabitants die. The only question that can be raised concerning any of these documents is, whether they comprehend data sufficiently extensive whereon to found general conclusions, as to the true law of mortality of the district. This I must leave to the determination of the reader. I can only vouch for their authenticity.

The data on which the following tables are founded, are the parish registers and the parliamentary returns. Abstracts of all the registers in the Hundred were made by myself, with the utmost attention to accuracy, and it is believed that the tables constructed from these, also by myself, contain no material errors.

They comprehend the whole number of burials in each parish, antecedently to the years 1819 and 1820, as far back as the respective ages of the individuals are recorded. In no case is the series of years less than five; in some parishes it is as much as thirty-one, the average being nearly nine years, (8.84.) I now regret much that, in making my abstracts, I neglected to take any account of the sexes under the age of 80. The tables constructed from the parliamentary returns, are chiefly confined to the results of the census of 1821, on account of the more exact coincidence of this period with that comprehended in the parish registers.

For the sake of clearness, I shall divide the following tables into three series; the *first* exhibiting the law of mortality of the whole district of the Landsend, comparatively with that of the kingdom generally, or of particular parts of it; the *second* exhibiting the same law as it obtains among the different classes of inhabitants in the district, more particularly in the two principal classes of agriculturists and miners; the *third* presenting a comparative view of the purely agricultural or more healthy parts of the district, with certain other parts of England somewhat similarly circumstanced, with the view of determining the natural law of mortality of the district, when uninfluenced by causes having a deleterious effect on health, and most particularly with the view of settling the relative longevity of the inhabitants.

TABLE VIII.—Abstract of the Parish Registers of the Hundred of Penwith, showing the actual Deaths, at all Ages, among the whole Inhabitants.

	Deaths from										
Birth to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to	Total
3331	499	670	525	579	663	950	1091	656	78	1	9042

TABLE IX.—Relative Proportion of Deaths, at all Ages, in the Hundred of Penwith, and at Carlisle,* the whole being assumed to be 10,000 in each Place.

	Deaths from										
	Births to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
Landsend, ...	3685	551	740	581	640	735	1050	1206	725	86	1
Carlisle, ...	3569	384	462	576	671	817	1244	1440	732	98	7

TABLE X.—Law of Mortality of the whole Population of the Hundred of Penwith, relatively to that of the Carlisle Tables, calculated from the Abstracts of the Parish Registers, the total Births being assumed to be 10,000.

	Number of Persons that will be alive at each age.									
	at 10	at 20	at 30	at 40	at 50	at 60	at 70	at 80	at 90	at 100
Landsend, ...	6315	5764	5024	4443	3803	3070	2020	814	89	3
Carlisle, ...	6431	6047	5585	5009	4338	3521	2277	837	105	7

TABLE XI.—Actual Number of Persons alive, at each Age, in the Hundred of Penwith, in the year 1821.

Age.	From Birth to 5	5 to 10	10 to 15	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100
Males,...	4674	3768	3591	3018	4324	2922	2294	1611	1038	486	101	5
Females,	4618	3831	3203	3083	5025	3278	2607	1974	1514	764	240	26
Both, ...	9292	7599	6794	6101	9349	6200	4901	3585	2552	1250	341	31

TABLE XII.—Proportional Number of Persons alive, at each Age, in 1821, in the undermentioned Places, supposing the whole Population to be 10,000 each sex, at each place.

	Birth to 5	5 to 10	10 to 15	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 & abo.
All England,...	2982	2611	2225	1983	3166	2365	1873.6	1318.9	905.6	450.1	121.1	9.9	.34
Co. of Cornwall	3045	2605	2256	2053	3131	2207	1751.1	1353.4	947.1	497.4	135.7	9.9	.23
Hun.of Penwith	3321	2626	2337	2087	3194	2143	1680.6	1232.8	805.5	430	123.2	11.3	.44

* The Carlisle Tables of Mortality, constructed from the Registers published by Dr. Heysham, are considered by many as furnishing a fair specimen of the law of mortality for England generally.—*See Milne on Annuities.*

TABLE XIII.—Proportion of Deaths to the living Inhabitants at the undermentioned Places.

	England and Wales	County of Cornwall.	Hundred of Penwith.
In 1811, ...	1 in 50	1 in 62	1 in 61
In 1821, ...	1 in 58	1 in 71	1 in 67
Mean, ...	1 in 54	1 in 66½	1 in 64

It results, from the foregoing series of Tables, that the claim to longevity set up by the Cornish Topographers for their native county, is by no means well founded in as far as regards the Landsend District, the whole population being comprehended in the estimate.

On the contrary, it appears to be established by these, more particularly by Tables VIII. X. and XII. that a considerably greater proportion of persons die in the early periods of life, that is under the 40th year, in the Hundred of Penwith, than in either the whole county of Cornwall, or at Carlisle; and that the mortality is even considerably above the average of the whole of England. As a necessary consequence of this, the numbers that attain to the higher periods of life, in this district, are proportionally smaller. This results from comparing with the other places the numbers that *die* at each age above the 40th year, as shewn by the parish registers, as also from comparing the numbers *alive* at each particular age, as shewn by the parliamentary returns. There is, indeed, a trifling exception to this in the extreme period of life, as will be seen by Table XII. from which it results that the proportion of persons that attain their 80th year, is greater in the Hundred of Penwith than the average of all England, although very considerably less in the whole county of Cornwall; while the proportion that reach their

90th and 100th years, is greater in Penwith than in all Cornwall and in all England.

In this respect, then, it is, indeed, true, that there is greater longevity in the Landsend District than elsewhere; but the general character of the district, as exhibited in these Tables, is directly the reverse of this, the inhabitants, taken as a body, dying at much earlier periods of life than in the remainder of the county of Cornwall, or at Carlisle, or even in the whole of England taken collectively.

It remains to be inquired whether the statement now made can be justly applied to the whole population of this district, or whether it has especial reference to certain classes of the people only, who are subject to peculiar influences having a tendency to shorten life.

It was stated in a former part of this memoir, that the inhabitants might be classed, according to their occupations, as agricultural labourers, fishermen, handicraftsmen, or townspeople and miners, and that this last class bore a very large proportion to the others. The details formerly given of the habits and occupations of this class of persons, will prepare any one accustomed to hygeienic inquiries, to expect that they should suffer greatly in their health and have their lives shortened, in consequence of their mode of living. If it should appear, on inquiry, that the abbreviation of life, from this cause, is very considerable, it may alone account for the results obtained by the last series of tables, and still leave the longevity of the inhabitants, when undisturbed by artificial influences, such as is claimed for them by their native topographers. That this is the state

of the fact, will, I think, appear abundantly evident from the series of tables which I am now about to lay before the reader.

In constructing these Tables, I have not attempted any very minute classification of the inhabitants, from a conviction that such an attempt would defeat the object I had in view, of obtaining results on the great scale, which can alone be depended on in investigations of this nature. Instead of separating them into the different classes formerly enumerated, I have contented myself with such a general division as would enable me to contrast the parts of the district where miners chiefly reside, with those where all the other classes chiefly reside, terming the former *mining parishes,* and the latter *agricultural parishes.* It is admitted that these terms are only comparatively appropriate, owing to the limited extent of the whole district, and the intermixture, more or less, of the two classes in every parish (two, perhaps, excepted) of the Hundred.

The plan I have followed in making the division, has been to class together all the parishes in which the number of miners exceeded the remaining classes, as found by the militia returns, terming these *mining parishes,* and *vice versa ;* without regarding whether the parishes so classed together were contiguous or not. This method was considered much preferable to any territorial division, as, while it correctly designated the *employment* of the inhabitants, (in other words, the artificial sources of disease,) it involved no risk of confounding the influence of *natural causes,* the small extent and character of the district rendering these *the same* over the whole

Hundred. It so happens, nevertheless, that, with one principal exception in the parish of St. Just, all the parishes included under the head of *mining*, lie nearly contiguous, and in the eastern division of the Hundred, while, with two or three lesser exceptions, the reverse holds good respecting the agricultural parishes. Out of the twenty-four parishes of the Hundred, only nine have been included under the character of mining; but it has happened, by a curious coincidence, that the population of each of these divisions is precisely the same within one.* In the following inquiry it is also to be borne in mind that, of the fifteen parishes included under the name of agricultural, many contain a great proportion of miners, and also the most crowded and dirty towns and villages of the whole district, these latter having a population amounting to one-third of the whole number of inhabitants. These circumstances, of course, will render the results much less strong in support of the proposition of the unhealthiness of mining, than would have been the case had the parishes been truly and purely agricultural.

The following table exhibits the division of the parishes adopted, the total population, and the proportion of miners in each, in the year 1811 :—

* In again referring to the parliamentary returns for 1821, I find that I have given the population of the parish of Ludgvan, and, consequently, of the agricultural district, 60 below the truth; but it will be admitted that this small error, in a total of 25,000, can lead to no practical error of any moment, in an inquiry like the present.—Chichester, Sep. 1833.

TABLE XIV.

Names of Parishes.	Population in 1811.	*No. of Men between the Age of 18 and 45 liable to serve in the Militia.*	
		Miners' M.	Cornwall M.
I.—Mining Parishes.			
Camborne, ...	4714	666	248
Crowan, ...	3021	204	83
Gwinear, ...	1952	157	92
Illogan, ...	4078	294	172
Redruth, ...	5903	689	349
St. Just, ...	3057	375	110
Perran, ...	626	65	52
St. Hilary, ...	1248	89	89
Towednack, ...	532	56	43
Total, ...	25131	2595	1238
II.—Agricultural Parishes.			
Ludgvan, ...	1431	94	125
Village of Marazion, ...	1022	20	82
St. Ives, Parish and Town,...	3281	71	259
Buryan, ...	1188	43	117
Gulval, ...	1224	25	140
St. Levan, ...	434	0	69
Gwithian, ...	372	9	57
St. Erth, ...	1317	41	148
Madron, ...	1817	49	195
Town of Penzance, ...	4022	4	549
Paul and Fishing Villages,...	3496	37	352
Sancred, ...	790	25	104
Sennen, ...	495	0	96
Zennor, ...	671	45	51
Lelant, ...	1180	48	65
Morvah, ...	273	19	25
Phillack, ...	2119	74	145
Total Agricultural Parishes,	25132	604	2579

The Tables which follow are strikingly illustrative of the influence of mining in shortening life in this district.

TABLE XV.—Relative Proportion of Deaths to the living Inhabitants, among the Mining and Agricultural Population respectively.

	Population in 1811.	Deaths in 1811.	Proportion of Deaths.
In the nine Mining Parishes, in which the Mining Population is to the other classes as 100 to 47,	25,131	433	1 in 58
In the fifteen Agricultural Parishes, (including Towns and Fishing Villages), in which the Mining Population is to the other classes as 100 to 426,.....	25,132	390	1 in 64

TABLE XVI.—Actual Deaths, at different ages, among the Mining and Agricultural Population respectively, from the Parish Registers.

	Deaths from										
	Birth to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
Mining Parishes—Population 25,131, ...	1627	268	323	279	307	353	447	447	241	31	1
Agricultural Parishes—Population 25,132, ...	1704	231	347	246	272	310	503	644	425	47	0

TABLE XVII.—Relative proportion of Deaths at different Ages, the whole assumed to be 10,000.

	Deaths from										
	Birth to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
In the nine Mining Parishes, ...	3765	619	746	645	709	816	1035	1035	557	71	2
In the fifteen Agricultural Parishes,.....	3604	488	734	520	576	656	1063	1363	898	99	—

TABLE XVIII.—Proportion of Deaths in the two Sexes above the 80th year.—Actual number of Deaths from the Parish Registers.

	Deaths from 80 to 90.		Deaths from 90 to 100.		Proportion of Deaths from 80 to 100.	
	Males.	*Fem.*	*Males.*	*Fem.*	*Males.*	*Fem.*
In the 9 Mining Parishes,	73	168	9	22	100	231
In the 15 Agricult. Par.	173	252	13	34	100	153

TABLE XIX.—Actual Ages and Sexes of all Persons dying above the 80th year, as far back as is recorded in the Parish Registers.

Fifteen Agricultural Parishes.

	Ages at which the Persons die.																					Total of each sex.	Total of both sexes	Total Dths. at all ages.
	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	107			
Males,....	15	18	14	16	7	6	8	3	6	5	5	1	3	0	1	1				1		110	315	3629
Females,	26	21	23	25	16	17	10	16	14	8	3	4	7	1	4	5	2	1		2		205		

Nine Mining Parishes.

	Ages at which they die.																					Total of each sex.	Total of both sexes	Total Dths. at all ages.
	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	107			
Males,....	7	11	9	15	12	4	5	1	2	1	4	2	2	1								76	221	3833
Females,	14	24	7	21	15	5	11	10	9	7	4	3	3	3	2	3	2			2	1	145		

TABLE XX.—Law of Mortality of the different classes of Inhabitants, the Births in each class being assumed to be 10,000, calculated from the Parochial Registers.

	Total numbers that will be alive at each age.									
	at 10	at 20	at 30	at 40	at 50	at 60	at 70	at 80	at 90	at 100
Fifteen Agricultural Parishes,.....	6396	5908	5174	4654	4078	3422	2359	996	99	0
Nine Mining Parishes, ...	6235	5616	4870	4225	3516	2700	1667	632	75	2

TABLE XXI.—Proportional number of Persons alive, at each age, in 1821, among the different classes of the Hundred of Penwith, supposing the whole population to be 10,000 each sex.

	Males.		*Females.*		*Both Sexes.*	
	Agricul.	Mining.	Agricul.	Mining.	Agricul.	Mining.
Under 5 years,.....	1523	1809	1375	1673	1449	1741
From 5 to 10, ...	1305	1395	1194	1334	1249	1364
10 to 15, ...	1268	1310	1022	1099	1145	1204
15 to 20, ...	1092	1079	1048	1000	1070	1039
20 to 30, ...	1412	1670	1625	1704	1518	1687
30 to 40, ...	1086	1020	1160	1021	1122	1020
40 to 50, ...	876	781	910	823	893	802
50 to 60, ...	682	492	707	607	694	549
60 to 70, ...	479	285	554	455	516	370
70 to 80, ...	223	134	302	209	262	171
80 to 90, ...	52	23	93	67	72	45
90 to 100, ...	2	2	10	8	6	5
100, &c.						

TABLE XXII.—Proportional number of Persons alive, at each age, in 1821, in the adjoining Hundreds of *Penwith* and *Kerrier*, (the Mining Population being, to the other classes, nearly double in Penwith to what it is in Kerrier,) supposing the whole Population to be 10,000 each sex.

N. B.—Actual Population of Penwith, 58,413

..... Kerrier, 32,774

Proportion of Miners to the other classes in Penwith, 79 to 100

..... Kerrier, 43 to 100

Ages.	*Males.*		*Females.*		*Both Sexes.*	
	Penwith	Kerrier.	Penwith	Kerrier.	Penwith	Kerrier.
From Birth to 5,.....	1742	1579	1579	1372	1660	1476
5 to 10,.....	1356	1452	1270	1250	1313	1351
10 to 15,.....	1283	1279	1054	1044	1168	1161
15 to 20,.....	1084	1088	1003	1038	1043	1063
20 to 30,.....	1546	1348	1648	1661	1597	1504
30 to 40,.....	1057	973.6	1086	1105	1071	1039
40 to 50,.....	822.7	855.1	857.9	916.2	840.3	885.6
50 to 60,.....	579.6	649.	653.2	747.2	616.4	848.1
60 to 70,.....	305.	421.9	500.5	482.8	402.7	452.3
70 to 80,.....	176.24	221.55	253.89	277.01	215.6	444.35
80 to 90,.....	37.90	50.68	85.39	88.72	61.19	69.25
90 to 100,.....	2.53	3.94	8.86	7.39	6.24	5.11
100 and upwards,...			0.32	0.56	.16	.28

The above series of Tables place, in a strong point of view, the great inferiority of the mining parishes in respect of longevity, when compared with the agricultural parishes and towns; and, consequently, the very deleterious influence exercised by the occupation of the miner over his health and life. There seems hardly any possible source of fallacy in the inferences afforded by these Tables, as they all concur in exhibiting the same or similar results, although drawn from different sources. I will direct the reader's attention to some of the most striking of the results afforded by the Tables, in proof of the influence of mining in shortening life.

1. It is shown by Table XV. that, in the year 1811, the proportion of deaths to the living inhabitants, was one-tenth greater in the mining parishes, than in the agricultural parishes and towns.

2. It results from Table XVII. that out of the same proportion of births, (10,000) there is a regular annual superiority of deaths in the mining district, over the agricultural, from birth to the 60th year, amounting, in the whole of that period, to 722, or one-fourteenth of the whole births. This increased mortality is greatest in the prime of life, between the 30th and 60th year, the total being 2170 in the mining, and 1752 in the agricultural parishes, that is, considerably above one-fifth more in the former. This result is the more striking, as it appears from Table XXI. that the numbers of persons living, between the 30th and 60th year, is considerably less in the mining than in the agricultural districts. It appears from Table XX. that there is a much greater mortality in the mining parishes, even in very early

life, than in the agricultural, a fact which can only be explained by the general law of increased mortality, at all ages, which seems to obtain in all manufacturing and crowded communities. Thus, at the 30th year, the proportion of the population is as follows:—Mining, 4870; agricultural, 5174. At the 60th year, the disproportion is still greater, and, of course, still against the mining population, the number in the mining parishes being 2700, while in the agricultural it is 3422.

3. It is seen by Tables XVI. and XVII. that, by the 60th year, the whole number of the mining population has become so reduced, that, from this age upwards, the annual number of deaths is greater in the agricultural class. Thus, from Table XX. it appears that at the 70th year, the proportional number of survivors, in the two classes, is as follows: in the agricultural, 2359; in the mining, 1667; and between this and the 90th year, (a period of 20 years,) there occur no less than 669 more deaths in the former than in the latter. This shows that previously to the 70th year, all the increased mortality that depended on mining, has disappeared for want of subjects, leaving the survivors to be influenced by the natural causes of decay only.

4. The powerful influence of the occupation of the miner in shortening his life, is further illustrated in a very satisfactory manner, by Table XVIII. which gives the proportion of the deaths, in the two sexes above their 80th year, in the two classes of persons. Every one is aware of the superior longevity of the female sex, in all countries, and under almost all circumstances. In countries where the

male population are peculiarly exposed to causes destructive of health, it is to be expected that the proportional longevity of the females should be increased beyond the usual ratio; and this ought to hold good in the mining districts of Cornwall, where the deleterious effects of mining are almost exclusively confined to the male sex. Accordingly we find from the Table above mentioned, that the proportion of the sexes that attain their 80th year, is, in the agricultural districts, as 153 females to 100 males, while, in the mining districts, the proportion is as great as 231 to 100 males.

Precisely similar results are obtained from the comparison of the number of the two sexes alive, at an advanced age, among the two classes, as shown by Table XXI. from which it appears that while the proportion of males to females, above 60 years of age, is, in the agricultural parishes, as 5 to 6, it is, in the mining parishes, as 5 to 8, the totals being as follows:—

	Males.	*Females.*
Agricultural Parishes, ...	756	959
Mining Parishes, ...	444	739

And this result is still more strikingly and more unequivocally confirmed, by comparing the two neighbouring Hundreds of Penwith and Kerrier, as is done in Table XXII. These differ in no particular respects that could influence health, except in their relation to mining.

Whilst in the Hundred of Penwith, the proportion of miners to the other classes is as 79 to 100, it is, in Kerrier, only as 43 to 100. If, then, mining is peculiarly destructive to the male sex, we ought to find

that the proportion of males to females is much less in the Hundred of Kerrier than in the Hundred of Penwith; and the inspection of the Table above mentioned, proves this to be the fact, there being, in the Hundred of Kerrier, 6 females to 5 males; while there is, in Penwith, 8 females to 5 males, the totals being as follows:—

	Males.	*Females.*
Hundred of Kerrier, ...	698	856
..... Penwith, ...	529	848

In conclusion, it is abundantly proved by the foregoing calculations, that the natural longevity of the district of the Landsend, is lessened, in a very remarkable degree, by the artificial influence of mining.

It remains to be inquired whether, when this influence is removed, the longevity of the inhabitants, when developed under more favourable circumstances, equals or exceeds that of the other parts of the Kingdom similarly circumstanced.

The means we have of making this last-named inquiry, are to institute a comparison between the data supplied by the parish registers and parliamentary returns, from the parts of the district least subject to the influence of mining, and similar data from other parts of the Kingdom. In doing this, I shall make a somewhat minuter classification of the population than I have attempted in the preceding series of Tables, with the view of obtaining results which are not at all, or very little, liable to be influenced by the artificial causes of disease that exist in the district. I shall, therefore, compare with other parts of the Kingdom, 1st, the 19 agricultural parishes included in the preceding tables; 2nd, a cer-

tain number of the Landsend parishes which contain neither mines nor towns or villages.

TABLE XXIII.—Law of Mortality of the Agricultural Population of Penwith, relatively with that of the Carlisle Tables. Total 10,000 each sex.

	Total numbers that will be alive at each age.									
	at 10	at 20	at 30	at 40	at 50	at 60	at 70	at 80	at 90	at 100
Fifteen Agricultural Parishes of the Hundred of Penwith,	6396	5908	5174	4654	4078	3422	2359	996	99	0
Carlisle,	6431	6047	5585	5009	4338	3521	2277	837	105	7

TABLE XXIV.—Relative proportion of Deaths, at different Ages, in the Agricultural Parishes of Penwith, and at Carlisle, calculated at 10,000 each place.

	Deaths from										
	Bth. to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
Fifteen Agricultural Parishes of the Hundred of Penwith	3604	488	734	520	576	656	1063	1363	898	99	0
Carlisle,	3569	384	662	576	671	817	1244	1440	732	98	7
Three Landsend Parishes,	3003	296	733	477	623	623	1245	1572	1208	219	

TABLE XXV.—Proportional Number of Persons alive at each age, in 1821, in the undermentioned places, calculating the whole Population, in each place, to be 10,000 each sex.

	Bth. to 5	5 to 10	10 to 15	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
All England,	2982	2611	2225	1983	3166	2365	1873.6	1318.9	905.6	450.1	121.1	9.9	.34
Coun. of Cornwall	3045	2605	2256	2053	3131	2207	1751.1	1353.4	947.1	497.4	135.7	9.9	.23
Agricul. Parish of Penwith	2898	2499	2290	2140	3037	2246	1786	1389	1033	625	145	12	—
Hund. of Kerrier..	2951	2702	2323	2116	3009	2078	1771.3	1396.2	904.7	499.5	139.4	11.3	.56
3 Landsend Parishes...	2861	2435	2440	2137	3022	2244	1572	1331	1059	698	196	14	—

TABLE XXVI.—Proportional Number of Females alive at the undermentioned places, above the 60th year. Total 10,000.

	From 60 to 70	70 to 80	80 to 90	90 to 100
In all England,	458	228	64	5
In the County of Cornwall,	509	268	81	6
In the Rape of Chichester, (Sussex,)	490	261	61	8
In fifteen Agricultural Parishes of Penwith,	554	302	93	10
In the three Landsend Parishes,	536	428	114	14

TABLE XXVII.—Abstract of the Parish Registers of the three Landsend Parishes, from 1813 to 1820 inclusive.

	Deaths from										
	Bth. to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	Tot.
Buryan,	46	3	13	4	10	11	27	27	22	2	165
St. Levan,	12	1	3	2	4	2	4	14	2	1	45
Sennen,	24	4	2	7	3	4	3	4	9	3	63
Total Deaths,	82	8	18	13	17	17	34	45	33	6	273

TABLE XXVIII.—Actual Ages of Persons dying in the three Landsend Parishes, above the 80th year, during the eight years.

Age.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	Tot.
Males,	2	1	...	2	1	...	...	1	2	1	1	...	3	...	...	...	14
Females,	3	...	2	6	...	1	1	3	4	2	...	...	2	...	...	1	25
Total,	5	1	2	8	1	1	1	4	6	3	1	...	5	...	...	1	39

In reviewing this last series of Tables, we find that they all concur in demonstrating the superior longevity of the inhabitants of this district, when unaffected by the influence of mining. They, at the same time, confirm the results of the two former series of Tables, as to the great mortality among the population of this district in the earlier and middle periods of life, except in the three Landsend parishes.

Before pointing out more particularly some of the strongest evidences supplied by these Tables, of the great longevity of the agricultural population of the Landsend, it may be proper to give some explanation of the data from which the column in the preceding Tables, entitled "three Landsend parishes, or purely agricultural," has been framed, lest I should be attaching more importance to this document than it is really entitled to.

The three parishes of Buryan, Sennen, and St. Leven, are the westermost of the district, and, consequently, of England, and are, in the immediate neighbourhood of the promontory, termed the Landsend. They constitute a flat table-land overlooking the ocean, with lofty and precipitous shores. The soil is dry and fertile, and they contain a large proportion of corn-land. They are purely agricultural, and are the only parishes in the Hundred which contain no miners. Sennen and St. Levan, however, contain a few fishermen, and Buryan a few miners, principally streamers. They contain 10576 statute acres, and, in 1821, the number of inhabitants, by the census, was 2622, viz. 1223 males, and 1399 females.* The documents from which the columns respecting the deaths, in these three parishes, in the Tables are constructed, are abstracts of the burial registers during a period of eight years, viz, from 1813 to 1820 inclusive, during which time the total deaths were 273.

Considering the extent and population of these three parishes, and the length of the period for which

* This disproportion of the sexes is owing, probably, to the emigration of the males to the mining parishes and sea-ports.

we have accurate records of the deaths in them, I see no reason why the statistical results supplied from them, in the Tables, may not be considered as affording a specimen of the true law of mortality and longevity of the district, when the health of the inhabitants is undisturbed by any other causes than those which attach to the simplest and purest condition of agricultural or rural life, that is, to as natural a state of life as the present form of society, in this country, will permit.

In these three parishes, the annual average number of deaths, for the eight years ending with 1820, was 34. This makes the proportion of deaths to the living, reckoning according to the census of 1821, only as 1 in 77; but, as the population of the three parishes was only 2117 in 1811, it will be more correct, in giving the proportion of deaths to the living, to take the mean of the population of the two periods of 1811 and 1821. This increases the annual proportion of deaths to 1 in 69. Even this, however, is very high, much higher than that of any place noticed in the tables.

It results from Table XXIV. that, in these parishes, a much smaller proportion of the inhabitants die in the first years of life, than in the other parts of the district; and that they, alone, exhibit a lesser degree of mortality than the Carlisle Tables, at this period of life. From Tables XXVII. and XXVIII. it results that one-half of the born attain the 50th year, and that exactly one-seventh reach beyond their 80th year. It is, indeed, in the very advanced period of life, in what is properly termed longevity, that the inhabitants of these parishes stand pre-eminent.

It results from Tables XXIII. and XXIV. that in the whole fifteen agricultural parishes of the Landsend, the proportion of persons that reach the 70th and 80th year, is considerably greater than that recorded in the Carlisle Tables, although the number that reach the next highest decennial period is greater in Carlisle; and from Table XXV. it appears that the proportion of persons alive, in 1821, above their 70th year, was very considerably greater in the whole agricultural parishes, than in either the county of Cornwall or in all England.

In the three purely agricultural parishes of the Landsend, however, all the Tables exhibit a remarkable superiority of numbers after the 70th year, as will appear from the following abstract:—

Proportion of Deaths above the 70th year.

In Carlisle,	2277
In the fifteen agricultural parishes of the Landsend,	2360
In the three agricultural parishes of the Landsend, ...	2999

Table XXV. presents analogous results, from the numbers living at the same advanced periods of life, as appears from the following abstract:—

Proportion of Persons living above the 70th year.

In all England,	581
In the county of Cornwall,	643
In the fifteen agricultural parishes of the Landsend, ...	782
In the three agricultural parishes of the Landsend, ...	908

I observed, on a former occasion, that female life not only was best calculated to show the relative, but absolute, longevity of different places. And it will appear from this test, as exhibited in Table XXVI. that the Landsend District still vindicates its superiority in a very striking manner. In this Table I

have included the Rape of Chichester, in Sussex, (exclusive of the city of Chichester,) a purely agricultural district, containing 13,483 females, all of whom belong to country parishes, with the exception of 691 in the small town of Midhurst. The totals exhibited by this Table is as follows :—

Proportion of Females above 70 years of age.

In all England, ...	755
In the Rape of Chichester, ...	820
In the county of Cornwall, ...	863
In the fifteen agricultural parishes of the Landsend,	949
In the three agricultural parishes of the Landsend, ...	1092

In conclusion, I think, after the preceding investigation, we are forced to concede to the inhabitants of the Landsend District, when exempted from extraordinary causes of disease, the privilege of uncommon longevity, claimed for them by their native topographers.

N. B.—Chap. II. containing the Medical History of the Inhabitants, will be published on a future occasion.

APPENDIX No. I.

*List of Simple Minerals found in the Landsend District, with their particular Localities.**

Quartz—Rock-crystal, in Huel Diamond (St. Just) Mellenoweth.
Ditto—crystallized in the primitive rhomboid—St. Just.
Ditto—pseudomorphous, viz. in cubes in Botallack and Huel Alfred; in rhomboids dodecahedrons and dog's-tooth crystals in Botallack; in octohedrons in North-downs.
Ditto—radiated, Huel Game, Huel Friendship.
Ditto—stalactitic, Botallack, Huel Edward, Huel Alfred.
Ditto—stellated, St. Just.
Ditto—amethystine, Botallack and Bosavern, in St. Just—Pednandrea.
Ditto—crysolite green, brown, black, irisated, all St. Just.
Ditto—ferruginous, (eisenkiesel) Huel Owls in St. Just, Mousehole.
Ditto—spongiform or cellular, swimming stone, Relistian, Tincroft, Pednandrea.
Ditto—enclosing oxide of iron, oxide of tin, chlorite, tourmaline, eiscakiesel, all St. Just.
Opal—Fire Opal, Higher Rosewarne.
Ditto—common and semi, Rosewarne, Huel Carn, Botallack, Huel Spearn, Trewollard, Polgine.
Isopyre—so named by Mr. Heidinger, like black opal, but differing from it in composition (see Philos. Magazine) Huel Carn.
Chalcedony—Botallack, Huel Edward, Boscagell, Huel Alfred, Trevaskus, Pednandrea, West Huel Unity.
Jasper—common, Botallack, Dingdong, West Huel Unity, Tincroft.
Hornstone—Botallack, The Wherry, Huel Vor.
Garnet—common at Chycornish Carn and Roscommon Cliff, in St. Just.
Prehnite—In the rocks between Botallack and Huel Cock.
Stilbite—Ditto, Ditto.
Epidote—Botallack. In the rocks in Mount's Bay.

* For this list I am indebted to my friend, Joseph Carne, Esq.

Axinite—Botallack, Trewellard, Roscommon Cliff. The Greeb-rock in Mount's Bay.

Clay Slate—Nearly all the rocks except the Granite and Greenstone.

Lithomarga—Cook's Kitchen and Tincroft Mines.

Augite—St. Just.—Hornblende, Huel Cock Cliff.

Tremolite—Botallack.

Actinolite—St. Just, the Greeb-rock in Mount's Bay.

Asbestus—St. Just.

Pinite—in the Granite at Trewellard, Tol-Pedn-Penwith, St. Michael's Mount, and many parts near the Landsend.

Topaz—small white, at St. Michael's Mount.

Beryl—Ditto, Ditto.

Mica—in the granite in general, in hexagonal plates and prisms in St. Just, in veins at St. Michael's Mount.

Felspar—in the granite, in very large crystals at St. Buryan, in smaller crystals at St. Just, Penberthy Crofts, Trevaskus.

Talc—in Huel Cock.

Steatite—Botallack, Carnyorth, Tincroft.

Chlorite—in much of the granite; granular in the heaps of the Wherry Mine, near Penzance; laminated at Relistian; crystallized at Roskear. Earthy chlorite occurs in the tin veins of St. Just.

Schorl—in much of the granite; radiated near the Logan Rock; stellated at Huel Cock; crystallized at the Bunny; frequently with quartz forming shorl-rock.

Needlestone—at Botallack.

Analcime—St. Just.

Pitchstone—Huel Edward.

Tourmaline—St. Just.

Calcareous Spar—in veins and crystallized, St. Just.

Schiefer spar—St. Just.

Arragonite—in needle crystals, and also botryoidal, Huel Edward, and in hexagonal prisms and rhomboids, white and deep red, Levant—and brownish white in the rocks near Hayle.

Flos ferri—Levant.

Pearlspar—Huel Castle, Huel Owls, Huel Fortune.

Apatite—white and green, St. Just; green, beautifully crystallized, St. Michael's Mount.

Fluor—in many of the copper veins; compact and crystallized in Botallack, in the tin veins of Dingdong, and other mines.

Carbonate of Strontian—Botallack.
Gypsum—selenite, Roscommon Cliff.
Arsenical Iron—(Mispickel,) St. Just, Relistian.
Iron Pyrites—in almost every mine in Cornwall.
Magnetic iron Pyrites—in Botallack.
Oxydulated Iron—magnetic, Botallack.
Specular Iron—Carnyorth, Parknoweth, Huel Owls, Botallack, and other mines, all in St. Just. Massive, camellar, and crystallized, also in Tincroft.
Hydrous oxide of iron—in Botallack. Wood iron, or wood-like oxide of iron, St. Just.
Red Hematite—Huel Bellon, Botallack.
Compact and scaly red iron orë and red chalk—at Little Bounds, (St. Just.)
Brown Hematite—in Tincroft, and in several mines in St. Just.
Compact brown iron ore—in Botallack.
Black Hematite—in Huel Bellon.
Ochery black iron ore—in Huel Edward.
Spathose Iron—massive and botryoidal in Huel Cock; in concretions in Levant; stalactitic in Botallack; crystallized in Huel Owls, Huel Bellon, Huel Cock, Boscagell, Tincroft, and Huel Fortune; fibrous in Tincroft.
Phosphate of Iron—crystallized and earthy, in Parknoweth.
Grey oxide of manganese—earthy, Pednandrea.
Oxide of tin—massive and crystallized, in all the tin mines and streams, and at St. Michael's Mount.
Wood tin—in the streams of St. Paul, St. Buryan, St. Just, and several other parishes; also granular tin.
Wood tin, Toad's eye tin, and *concretions of tin*—similar to what are usually found in streams, in a vein in the Garth Mine, near Penzance.
Sulphuret of tin—in St. Just.
Wolfram—St. Just, St. Michael's Mount, Huel Fanny.
Uran-ochre or *Pitch-blende*—Botallack, Huel Edward, Huel Trenwith, Tincroft and Tolcarne.
Uranite—Huel Edward, Tincroft, Tolcarne.
Native Bismuth—Botallack, Herland, Huel Sparnon.
Sulphuret of Bismuth—Botallack, Huel Cock.
Cupriferous ditto—Botallack.
Carbonate of Bismuth—Ditto.

Arsenical Cobalt—bright white, Botallack; Grey Cobalt, Botallack, Herland, Huel Sparnon, the Wherry, Dolcoath.

Earthy Cobalt—The Wherry.

Arseniate of Cobalt—Botallack, the Wherry, Dolcoath, Huel Sparnon.

Native silver—Capillary, Herland, Huel Ann, Levant, Huel Alfred and Huel Basset; crystallized, Levant.

Sulphuret of silver—massive and crystallized in Herland, Dolcoath, and Huel Basset.

Black ditto—Herland.

Red or ruby silver—crystallized, Dolcoath.

Native copper—massive and acicular, Levant, Huel Spearn; moss-like, Huel Rodney; crystallized in Huel Rodney, Levant, Condurrow, Huel Prosper, &c; capillary in Huel Prosper; massive in most of the copper mines.

Vitreous copper—massive and crystallized in Botallack, Levant, Tincroft, Cook's Kitchen, Dolcoath, Coenver, Huel Abraham, Camborne vean, &c.

Buntkupfererz—in Botallack, Tincroft, Cook's Kitchen, Camborne vean, and Dolcoath.

Copper Pyrites—massive in every copper mine in Cornwall; botryoidal and mamellated in Dolcoath, Tincroft, Huel Fanny, Relistian, &c.; slalactitic in Levant; cellular and swimming in Relistian; crystallized in Tincroft, North-downs, Botallack, Camborne vean, &c.

Tennantite—Dolcoath, Cook's Kitchen, Tincroft, North Roskear, &c.

Red oxide of copper—Polgine, Huel Prosper, Tincroft, Huel Spearn, Botallack.

Ferruginous oxide of copper and *black copper*—Huel Edward.

Malachite—Dolcoath, Huel Cock, West Huel Virgin.

Crysocolla—Huel Edward, Prince George.

Galena—massive in St. Just, and in several copper mines in other parts.

Carbonate of lead—Penberty Crofts.

Sulphate of lead—Mellenoweth.

Blende—in many of the copper and tin veins.

White oxide of zinc—Relistian.

APPENDIX No. II.

*A List of some of the rarer indigenous Plants in the Landsend District, with the names of the places where they are found.**

Pinguicula Lusitanica—Wet patches in different parts.
Utricularia vulgaris—Between Rosemorran and Kenegie.
Salvia Verbenaca—St. Ives.
Iris fœtidissima—Madron, &c.
Scirpus fluitans—In the marsh, Gulval.
Panicum dactylon—Beach between Penzance and Marazion.
Briza minor—Corn fields between Gulval and Ludgvan, plentifully.
Rubria peregrina—Hayle, Helston, &c.
Exacum filiforme—Between Penzance and Marazion.
Anchusa officimalis—St. Ives.
Convolvulus soldanella—Whitesand Bay, &c.
Campanula hederacea—Trevayler Bottom, Gear, Stamps, &c.
Verbascum nigrum—Gulval.
Chironia littoralis—Beach between Penzance and Marazion.
Samolus valerandi—Landsend, &c.
Illecebrum verticillatum—Gear Stamps, Landsend, Gulval, &c.
Herniaria hirsuta—Between Mullyan and the Lizard.
Cuscuta epithymum—Downs, Whitesand Bay, Lizard, &c.
Eryngium maritimum—Sea Shore, common.
Daucus maritimus—Landsend, Logan Stone, Botallack Mine.
Tamarix gallica—St. Michael's Mount, Lizard, Scilly Islands.
Drosera longifolia—Marsh between Penzance and Marazion.
Ornithogalum umbellatum—Near Marazion.
Scilla verna—St. Ives, plentiful; near Zennor, Morvah.
Rumex sanguineus—Gulval.
Alisma Damasonium—Between Penzance and Marazion.
Erica vagans—Near the Lizard, Soap Rock, Kinance Cove.
Saponaria officinalis—St. Levan.
Silene anglica—Very common in corn fields.
Arenaria verna—Kinance Cove.

* For this list I am principally indebted to the Rev. W. T. Bree.

Sedum telephium—Logan Stone.
——— *anglicum.*
Spergula nodosa—Near Marazion.
Euphorbia portlandica—Brehar Island, Scilly.
——— *paralia*—Scilly Islands.
Spiræa filipendula—Kinance Cove.
Glaucium Luteum—Scilly Islands.
Aquilegia vulgaris—St. Ives, Lelant, &c.
Helleborus viridus—Between Rosemorran and Kenegie.
Mentha rotundifolia—Between Penzance and Newlyn, &c.
Sachys arvensis—Corn Fields, very common.
Scutellaria minor—Bogs Gulval.
Bartsia viscosa—Bogs, common ; Corn Fields near Hayle.
Antirrhinum orontium—Gulval, Landsend.
Scrophularia scorodonia—St. Ives, Gulval, and Chyandour.
Sibthorpia europœa—Moist banks, common in this neighbourhood ; Gulval, Maddern Well, Trereife Road Avenue.
Cochlearia officinalis—Cliffs near the Sea, common.
——— *anglica*—Gulval, Penzance.
Bunias cakile—Beach between Penzance and Newlyn.
Brassica oleracea—Cliffs, Penzance, (perhaps introduced.)
Erodium maritimum—Sea Shore, common.
——— *cicutarium*—Sea Shore, common.
Geranium sanguineum—Kinance Cove.
——— *columbinum*—Ludgvan.
Genista pilosa—Kinance Cove.
Anthyllis vulneraria—Downs, Whitesand Bay.
Ornithopus perpusillus—Gulval Carne, &c.
Trifolium subterraneum—Near the Sea Shore.
——— *scabrum*—Near the Sea Shore.
Hypericum androsæmum—Gulval, Trevayler Bottom, &c.
Solidago virgaurea—Penzance, &c.
Inula helenium—Gulval, the Mount, St. Ives.
Pyrethrum maritimum—Sea Shore.
Anthemis nobilis—Common in this neighbourhood.
Orchis pyramidalis—Near Hayle.
Neottia spiralis—Between Penzance and Marazion.
Ruscus aculeatus—Lemorna Cove.
Myrica gale—Marsh, Gulval and Ludgvan.
Osmunda regalis—Common in moist places.

Aspidium oriopteris—Gear Stamps and New Mill.
——— *ditatatum variety*—Moist Banks in this neighbourhood.
Asplenium marinum—Cliffs near the Sea, St. Michael's Mount, Lemorna Cove, &c.
——— *lanceolatum*—Gulval, St. Michael's Mount, Lemorna Cove, &c.
Hymenophyllum Tunbridgense—Among the loose stones at Castle an Dennis, on the east side.
Dicranum cirviculatum—Gulval.
——— *crispum*—St. Mary's, Scilly.
Trichostomum polyphyllum—Gulval about Kenegie, Landsend, &c.
Neckera heteromalla—Trevayler Bottom, Try, &c.
Hypuum scorpioides—Gulval, Zennor, Landsend.
——— *alopecurum variety*—Gulval.
Hookeria lucens—Trevayler Bottom. Between Rosemorran and Kenegie, &c.
Mentha odorata—Buryan.
Antirrhinum repens—Near Penryn.
Polygonum aviculare—Castle Treryn.
Asparagus officinalis—Lizard.
Gnaphalium luteo-album.
Cynosurus echinatus—Ludgvan.
Euphorbia peplis—Between Penzance and Marazion.
Santolina maritima.
Saxefraga stellaris—Logan-rock.
Linum angustifolium—St. Ives.

APPENDIX No. III.

*List of Shells found on the shores of the Landsend.**

SHELLS FOUND IN WHITESAND BAY.

Lepas Anatifera, thrown up on the Beach amongst the Algæ.
Patella Cærulea, in the roots of Algæ.

In Sand.

Pecten Fragilis, single Valves, Opercularis ditto, Varius ditto, Obsoletus ditto, Distortus ditto, Lineatus ditto.
Bulla Catena, Diaphana, Halyotoidea, Truncata.

* For this list I am indebted to General Bingham.

Murex Tubercularis, Reticulatus, Adversus, Linearis, Septangularis.
Turbo Clathratulus, Reticulatus, Pullus.
Turbo Spiralis, Unidentatus, Striatus, Costatus, Cimex, Parvus, Vinctus, Interruptus, Cingillus, Punctura, Tenebrosus, Semicostatus, Striatulus, Clathrus, Jugosus.
Mya Suborbicularis, Distorta, single valves.
Patilla Apertura, Militaris, Pellucida, Fissura, Parva.
Mactra Triangularis, single valves.
Helix Depressa, Arcuata, Subulata, Auricula, Polita.
Cardium Rubrum.
Trochus Tumidus.
Nerita Glaucina, Rufa, Pallidula.
Arca Noæ or Fusca, single valves.
Buccinum Minimum.
Donex Irus, single valves; Castanea ditto.
Solen Minatus.
Mytilus Discors, Præcisus.
Balanus Balanoides, Striatus.
Tillina Donacina, single valves.
Anomia Ephippium.
Voluta Denticulata, Bidentata.
Cypræa Voluta.

SHELLS FOUND AT PENZANCE.

On the Beach between Penzance and Marazion.

Mactra Stultorum, Subtruncata, Solida.
Cardium Edule.
Donax Trunculus.
Venus Pullastra.
Venus Chione and Verrucosa, valves.

On the Rocks exclusive of the common Rock Shells, viz.

Turbo Littoreus and Radis; Nerita Littoralis; Trochus Cinerarius, Crassus, and Umbilicatus; Patella Vulgata; Mytilus Edulis and Incurvatus; Buccinum Lapillus and Reticulatum.
Murex Purpureus in tolerable quantities, Linearis in profusion, variety of Ditto rather scarce; all hitherto considered very rare indeed.

Murex Reticulatus, Adversus, both very scarce; Erenaceus.
Chiton Marginatus, Lævis, Lævigatus, Fascicularis.
Mya Suborbicularis.
Balanus Crancii, Balanoides.
Trochus Ziziphinus.
Cypræa Europæa.
Patella Parva.
Buccinum Macula.

In Fuci.

Turbo Pullus, Parvus, Quadrifasciatus.
Pecten Distortus, Varius, Opercularis, all small.
Helix Lacuna.
Patella Pellucida, and Cærulæa.
Buccinum Minimum.
Nerita Pallidula.

Land and Fresh Water Shells.

Turbo Tasciatus, Helix Virgata, on Marazion Green.
Helix Nautilea, Vortex, in the ditches between Penzance and Newlyn.

N. B.—All Live Shells except the single valves.

FOUND AT TRERYN COVE OR PORT CURNOW.

Donax Complanata, one valve.

In Sand.

Donex Irus, single valves; Castanea, ditto.
Turbo Clathrus, Clathratulus, Vinctus, Quadrifasciatus, Pullus, Parvus, Striatus, Costatus, Interruptus, Unidentatus, Cimax, Ulvæ, Punctura.
Patella Græca, Fissura, Parva, Pellucida, Cærulea.
Bulla Halyotoidea, New, Truncata, Catena.
Arca Noæ, single valves; Lactea, ditto.
Arca Pilosa, single valves; Tusca, ditto.
Murex Tubercularis, New, Adversus, Reticulatus, Linearis.
Mytilus Incurvatus, Modiolus, young; Barbatus, Discors.
Venus Pullastra, single valves.
Solen Minutus, Vespertinus, single valves; Strigellatus, ditto.
Mya Suborbicularis, Pubescens, young.
Pecten Fragilis, single valves; Varius, ditto; Opercularis, ditto; Distortus, ditto.

Cypræa Voluta, Bullata.
Trachus Ziziphinus, Tumidus.
Mactra Triangularis, mostly single valves; Solida, single valves.
Tellina Donacina, ditto.
Nerita Pallidula, Rufa.
Cardium Fasciatum, Rubrum.
Buccinum Macula, Minimum.
Helix Subulata, Depressa.

APPENDIX No. IV.

The Maxima, Minima and Media, of the Register Thermometer for twelve years, with the number of Inches of Rain, Prevailing Winds, with the Dry and Wet Days during that period; being an extract from the Meteorological Journal kept at Penzance, at the apartments of the Royal Geological Society of Cornwall. By E. C. Giddy, Esq. Secretary to the Society.

JANUARY.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days.*	*Wet Days*
	Max.	Min.	Med.				
1821	55	26	45.0	2.900	N. E.	15	16
1822	50	34	44.0	2.425	N. W.	15	16
1823	54	27	39.0	8.625	S. E.	14	17
1824	54	30	44.5	2.005	N. E.	17	14
1825	55	32	45.0	3.375	W.	17	14
1826	55	26	41.0	3.075	S. E.	23	8
1827	54	24	42.0	4.420	W.	12	19
1828	55	34	47.0	7.455	W.	12	19
1829	52	19	39.5	3.130	E.	20	11
1830	48	23	37.0	2.480	N. E.	16	15
1831	52	32	43.0	2.210	S. E.	13	18
1832	53	30	43.5	3.200	S. E.	16	15
Extremes and Mean.	55	19	42.5.	3.775	Ely. 8 Wly. 4	15.10	15.2

FEBRUARY.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days.*	*Wet Days*
	Max.	Min.	Med.				
1821	52	32	41.5	0.520	E.	25	3
1822	54	36	45.5	2.440	S. W.	17	11
1823	52	29	43.0	6.965	S. W.	6	22
1824	58	34	46.0	3.280	W.	8	21
1825	57	35	45.5	2.700	W.	16	12
1826	56	36	47.0	5.295	S. W.	9	19
1827	54	27	38.0	1.600	E.	21	7
1828	55	29	46.0	4.010	S. W.	7	22
1829	55	34	42.0	3.005	N. W.	17	11
1830	53	19	40.0	2.510	W.	11	17
1831	55	30	44.5	5.035	N. W.	8	20
1832	53	34	43.0	2.310	N. E.	16	13
Extremes and Mean.	58	19	43.5	3.305	Wly. 9 Ely. 3	13.5	14.1

MARCH.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailng Winds.*	*Dry Days.*	*Wet Days*
	Max.	Min.	Med.				
1821	56	31	46.5	4.205	W.	14	17
1822	58	39	49.5	2.800	S. W.	17	14
1823	55	35	46.0	3.205	S. W.	18	13
1824	62	32	45.0	5.740	N. W.	13	18
1825	61	35	46.0	3.610	N. E.	14	17
1826	66	34	46.5	2.310	N. E.	23	8
1827	56	32	47.0	5.265	W.	13	18
1828	59	34	47.0	3.445	N. W.	13	18
1829	56	34	44.5	1.465	S. E.	21	10
1830	61	39	48.0	1.635	N. W.	21	10
1831	55	32	46.0	3.585	N. E.	16	15
1832	54	32	45.5	4.470	N. E.	13	18
Extremes and Mean.	66	32	46.4	3.477	Wly. 7 Ely. 5	16.4	14.8

APRIL.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prsvailing Winds.*	*Dry Days*	*Wet Days.*
	Max.	Min.	Med.				
1821	64	37	50.0	2.300	N. W.	12	18
1822	65	36	48.0	2.380	N.	20	10
1823	58	38	47.0	1.980	N. E.	18	12
1824	60	36	45.0	2.600	S. E.	13	17
1825	67	36	48.0	1.005	N. E.	19	11
1826	61	33	50.5	1.110	N. W.	20	10
1827	61	36	48.0	1.360	W.	20	10
1828	62	38	49.0	7.500	S. W.	10	20
1829	59	38	47.5	5.500	N. W.	5	25
1830	62	32	49.5	5.085	W.	15	15
1831	64	36	51.0	2.095	N. E.	22	8
1832	63	36	48.5	2.905	N. E.	19	11
Extremes and Mean.	67	32	48.5	2.985	Wly. 6 Ely. 5 N. 1	16.1	13.11

MAY.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days*	*Wet Days.*
	Max.	Min.	Med.				
1821	62	40	50.5	3.385	W.	16	15
1822	69	42	55.5	1.340	E.	22	9
1823	70	44	55.0	2.770	S. W.	18	13
1824	72	38	53.0	3.955	N. E.	16	15
1825	67	48	55.0	4.085	S.	15	16
1826	71	38	54.0	0.600	N. E.	26	5
1827	63	40	52.0	5.315	W.	14	17
1828	66	44	56.5	3.765	N. W.	14	17
1829	69	43	56.0	0.560	N. E.	27	4
1830	65	42	54.5	2.415	W.	19	12
1831	66	36	53.5	2.440	S. E.	19	12
1832	68	40	52.5	4.225	N. E.	18	13
Extremes and Mean.	72	36	54.0	2.905	Ely. 6 Wly. 5 S. 1	18.8	12.4

JUNE.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days*	*Wet Days.*
	Max.	Min.	Med.				
1821	67	43	56.5	1.560	S. E.	21	9
1822	78	52	64.0	2.240	S. E.	20	10
1823	66	44	55.5	1.940	W.	17	13
1824	70	47	57.0	4.660	N. E.	17	13
1825	75	47	58.0	1.800	N. E.	17	13
1826	80	40	62.0	0.660	S. E.	26	4
1827	71	47	58.0	2.160	N. W.	16	14
1828	75	48	60.0	1.955	N. W.	20	10
1829	70	48	60.0	4.480	N. W.	17	13
1830	67	45	56.0	3.225	N.	16	14
1831	69	48	57.5	1.965	W.	22	8
1832	73	45	58.0	2.520	N. W.	19	11
Extremes and Mean.	80	40	58.5	2.430	Wly. 6 Ely. 5 N. 1	19	11

JULY.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days*	*Wet Days.*
	Max.	Min.	Med.				
1821	71	51	60.5	1.660	W.	21	10
1822	71	52	61.0	9.070	W.	9	22
1823	70	49	59.0	3.033	W.	11	20
1824	71	50	61.0	3.180	S. W.	18	13
1825	84	49	63.0	0.310	S. E.	29	2
1826	75	52	64.0	1.240	S. W.	22	9
1827	73	52	61.5	2.250	N. W.	20	11
1828	71	50	61.5	4.550	S. W.	11	20
1829	71	52	61.0	5.615	W.	8	23
1830	76	49	60.5	1.930	N. W.	23	8
1831	74	50	61.0	2.395	W.	17	14
1832	71	50	61.0	2.105	N. E.	23	8
Extremes and Mean.	84	49	61.2	3.111	Wly. 10 Ely. 2	17.8	13.4

AUGUST.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days*	*Wet Days.*
	Max.	Min.	Med.				
1821	73	55	63.0	4.470	S. E.	17	14
1822	77	48	61.0	2.200	W.	21	10
1823	68	48	59.5	7.085	W.	6	25
1824	72	49	61.0	2.600	W.	13	18
1825	73	52	62.0	3.140	N. W.	18	13
1826	76	52	63.0	2.115	W.	22	9
1827	70	50	59.0	2.865	N. E.	16	15
1828	70	51	61.0	4.575	W.	16	15
1829	69	49	60.0	5 515	N. W.	15	16
1830	68	47	58.0	4.370	N. W.	14	17
1831	75	53	63.5	1.815	N. E.	22	9
1832	71	48	60.5	5.815	W.	16	15
Extremes and Mean.	77	47	60.9	3.800	Wly. 9 Ely. 3	16.4	14.8

SEPTEMBER.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days.*	*Wet Days*
	Max.	Min.	Med.				
1821	72	49	60.5	4.520	S. W.	14	16
1822	68	45	59.0	1.865	S. E.	21	9
1823	67	46	57.5	3.645	W.	17	13
1824	68	40	51.5	4.165	S. E.	12	18
1825	72	46	58.5	2.730	S.	20	10
1826	70	46	60.0	4.315	S. E.	23	7
1827	68	48	58.0	2.820	S. W.	17	13
1828	70	49	60.0	3.045	S. E.	20	10
1829	67	43	55.5	6.820	N. W.	14	16
1830	64	45	55.0	6.030	N. W.	12	18
1831	67	47	58.5	4.025	S. W.	10	20
1832	65	47	57.0	0.985	N. W.	23	7
Extremes and Mean.	72	40	57.6	3.747	Wly. 7 Ely. 4 S. 1	16.11	13.1

OCTOBER.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days.*	*Wet Days*
	Max.	Min.	Med.				
1821	64	41	54.0	5.770	S. W.	13	18
1822	63	43	53.5	5.315	S.	11	20
1823	64	37	51.5	8.210	W.	12	19
1824	64	39	54.0	5.965	N. W.	5	26
1825	65	38	54.0	5.090	W.	19	12
1826	65	43	56.0	2.840	N. W.	24	7
1827	63	42	54.5	6.105	S. E.	9	22
1828	61	39	53.0	3.255	N. E.	14	17
1829	62	40	51.5	3.035	N. W.	9	22
1830	62	43	54.0	2.360	S. E.	19	12
1831	65	45	55.0	4.675	S. W.	14	17
1832	64	44	54.0	3.625	S. W.	18	13
Extremes and Mean.	65	37	53.7	4.687	Wly. 8 Ely. 3 S. 1	13.11	16.1

NOVEMBER.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days.*	*Wet Days*
	Max.	Min.	Med.				
1821	60	40	51.0	5.170	S. W.	9	21
1822	58	39	50.0	7.255	S. W.	8	22
1823	58	38	48.5	3.705	E.	20	10
1824	58	36	50.5	6.910	N. W.	6	24
1825	57	35	47.5	5.820	N. W.	5	25
1826	56	34	46.0	4.280	N. W.	17	13
1827	56	33	50.5	3.165	W.	9	21
1828	58	40	50.0	3.835	N, W.	16	14
1829	58	32	47.0	1.645	E.	15	15
1830	58	39	49.5	5.120	S. W.	14	16
1831	57	36	48.0	5.230	N. W.	9	21
1832	58	38	48.0	6.890	N. W.	8	22
Extremes and Mean.	60	32	48.8	4 918	Wly. 9 Ely. 3	11.4	18.8

DECEMBER.

Years.	*Register Thermometer.*			*Rain in Inches.*	*Prevailing Winds.*	*Dry Days.*	*Wet Days*
	Max.	Min.	Med.				
1821	56	36	47.5	9.500	S. W.	2	29
1822	54	28	40.5	2.545	E.	12	19
1823	55	40	46.5	6.295	W.	12	19
1824	57	32	48.0	6.470	W.	3	28
1825	56	29	45.5	5.285	N. W.	15	16
1826	58	36	50.0	4.400	N.	16	15
1827	55	40	49.0	7.580	W.	10	21
1828	56	39	49.5	6.225	S. W.	8	23
1829	53	26	40.5	2.275	N. E.	15	16
1830	53	25	43.0	5.315	N. W.	10	21
1831	55	31	46.5	4.920	S. W.	9	22
1232	56	37	47.0	6.095	W.	4	27
Extremes and Mean.	58	25	46.1	5.575	Wly. 9 Ely. 2 N. 1	9.8	21.4

N. B.—The Rain-gauge is at the ground level. Dry days are those on which no fall whatever takes place.

MEDICAL TOPOGRAPHY

OF

BRISTOL.

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THE term Medical Topography has been prefixed to the following paper, in conformity with general custom; but had its strict meaning been adhered to, the subjects of discussion would have become more limited than we have thought right to make them. Something more than an account of those local peculiarities or other external agents, which affect the health of the inhabitants, or, than a description of certain conditions of the latter, as illustrative of the effects of the former, might reasonably be expected in a medical report of a populous city. To us the mere medical topography appears but a part, though an important one, of such an enquiry; the primary object being to ascertain the facts relative to the health or disease of the inhabitants; which may then be traced to their relations with various circumstances, some of which belong to topography, while others consist of the habits, customs, and occu-

pations, which prevail in the locality. Were it desirable to invent a new name, perhaps Medical Demography would be more appropriate, at least, when applied to a thickly-peopled district. If the subject of the treatise be a locality with a small population, and which might require to be considered with reference to a *future* population or colony, Medical Topography would be the most apposite title, since it comprehends the principal objects of investigation; for soil, climate, geographical peculiarities, natural produce, &c. are almost the only hygienic or morbific agents which exist in such a situation; while, in the other instance, there are the more numerous and no less influential agents comprised in the various artificial circumstances of a fixed and crowded population.

According to this view, it would be more strictly in order, to speak, first, of the conditions of health and disease among the inhabitants of Bristol, and then to investigate their connections with external circumstances; but, for various reasons, it will be more convenient to take the latter first into consideration, just as in monographs upon special maladies, the causes are often enumerated and described before the detail of the symptoms. The first division, then, of our subject, will include those agencies which belong—1st, to the natural history of the locality; 2ndly, to the construction of the dwellings with reference to shelter, ventilation, drainage, &c.; and 3rdly, to the occupations, the physical and moral habits, the kinds of subsistence, clothing, &c. of the inhabitants. In the second part, we propose to make some remarks upon disease as it occurs in Bristol, and upon the average ratio of mortality.

Bristol is situated in 51° 30′ N. L., and 2° 40′ W. L. from Greenwich. It lies on both sides of the River Avon, and, although a county in itself, it occupies what would otherwise form a portion of both Gloucestershire and Somersetshire, which are here conterminous, and separated by the Avon; about four-fifths of the city being on the Gloucestershire, and one-fifth on the Somersetshire, side of the river; yet such is the ignorance of people living at a distance on this subject, that Bristol is vulgarly supposed to lie in Somersetshire.

The River Avon falls into the Bristol Channel or Severn Sea, about seven miles below Bristol; and, although scarcely more than sixty feet wide at low water, is navigable for ships of great burthen, the tide rising, at the Hotwells and the entrance of the floating harbour, to the height, at times, of thirty-six feet perpendicular.

In its course to the sea it passes, for some miles, in a narrow winding channel, through the picturesque and stupendous precipices of Clifton, commonly called St. Vincent's Rocks, which rise from the water's edge almost perpendicularly, to the height of nearly 300 feet. The channel through which the water here escapes, is formed by a fissure in the flat limestone ridge called Durdham-down, Leigh-down, Cleve-down, &c. which skirts the Bristol Channel for almost twenty miles below the *embouchure* of the Avon, serving as a wall to defend the vale or basin in which Bristol is situated, from the chilly breezes and stormy winds blowing in from the Atlantic, and essentially contributing to the well-known comparative mildness of the climate of Bristol and its vicinity.

It is a certain fact that the bare verge of the ocean, where the coast is unbroken by projecting headlands, and destitute of retiring bays or inlets, is considerably colder, on the average, than places a few miles inland, provided the latter are not materially elevated, and are, at the same time, sheltered from the sea breezes by intervening but moderate heights, such as the ridge of low hills just described, which here ultimately connect themselves (excepting some intervening fissures,) with the Cleeve-hills, Brockly-down, Black-down, and the Dundry-ridge; inclosing, in their circuit, the vale of Bristol, including the Hotwells, Bedminster, Long Ashton, Bourton, Backwell, Nailsea, Kem, Brockley, &c. which compose, together, an irregular oblong plain, nearly twenty miles in length, at the north-east end of which Bristol is situated, and where it is again covered in to the north and east, by the rising grounds of Kings-down, Stapleton, Kingswood, &c.

It is difficult to conceive a locality more advantageously circumstanced as to shelter, the boundary being, on all sides, sufficiently high to arrest or moderate the winds from whatever quarter, and not high enough to cool, sensibly, the atmosphere by its elevation. Were those eminences considerably higher; were they, for instance, one thousand feet or more high, instead of two or three hundred, as they actually are, the chilly atmosphere embracing their summits, and descending by its gravity to the places at their base, would more than counterbalance the protection they might afford from the maritime blasts; but being, as nearly as possible, of the requisite elevation for the purposes alluded to, we can

easily account for the fact of a less intensity of frost occurring in severe winters, in the localities above mentioned, than in the kindred vales of Cross, Mark, Bridgewater, &c. although lower down the Channel, and nearer the Ocean, but destitute of such a barrier against the winter sea-breezes as that above described.*

The same observations, as to temperature, will hold good with regard to the Welch or northern side of the Bristol Channel, where the advantage of a southern exposure is more than counterbalanced by the want, generally, of the protective barrier of low hills along the water's edge, and still more by the vicinity of high mountains, often covered with snow in winter, and at all times environed with an atmosphere of reduced temperature, the influence of which must be sensibly felt in the vales and low grounds adjoining.

The geographical position of Bristol is not less favourable than its locality, to the mildness of its climate. At the extremity of a narrow bay or inlet of a hundred miles in length, it participates of the equalizing influence of the ocean on its superincumbent atmosphere, and is comparatively exempt from the storms and tempests to which the more projecting coast of the English Channel is obnoxious, as well as from the humidity which characterises the south coasts of Devonshire and Cornwall; the latter being more advanced into the ocean, and surmounted every where by lofty mountainous ridges, attract and condense the clouds, surcharged with moisture, as they roll in from the Atlantic; and thus a smaller

* See Kirwan on Temperature.

portion of rain, and fog and damp, is left for the more inland situations. In this way we can easily account for the quantity of rain which falls in Bristol and its vicinity, being considerably less than in any of the more westerly districts, not averaging more than twenty-four inches; and for the smaller depth of snow at Bristol than in most other parts of the Kingdom. There have, in fact, been winters in which none whatever has been observed to fall; many, in which that which did fall, dissolved the instant it touched the ground; and four or five winters have passed in succession, in which it would have been impossible to make a snow-ball; and this, too, while in almost every other part of the Kingdom, the snow lay to a considerable depth. The deepest snow at Bristol, within our remembrance, was in 1795 and 1813. In both these winters, the snow, on the average, where it was not drifted nor partially blown off, was from ten to twelve inches deep, which, although incommodious on the roads the first morning, was not sufficient to interrupt, nor materially to retard travelling; while in all other directions, east, west, north and south, the depth of the snow and blocking up of the roads, were the theme of every letter and every newspaper. In the last of these years, the roads in Devonshire were for days impassable, and the snow in the streets of Exeter was reported to reach to the second story.

The difference between the temperature of Bristol and most other places in the Kingdom, is not less remarkable, particularly in very cold winters. In 1795, for example, the thermometer was observed in the various towns from Margate to Brighton and

Lewes, at or below zero. At Bristol and the Hotwells, the lowest observed was 12°. In other winters since that period, a nearly similar difference has been noticed; and even on a more elevated and exposed situation on Clifton Hill, from 180 to 200 feet above the level of the sea, the lowest temperature we ever remarked was $10\frac{1}{2}$, by Six's thermometer.

To any one in the habit of considering such matters, a single glance at the map will suffice to account for these phenomena; and whoever is acquainted with the superficial structure of the southern counties, would be led to expect that the country about Bristol must be comparatively exempt from the severity of the north-east winds which so remarkably pervade the east and south coast in winter, and particularly in spring. The reason is clearly this: the English Appennines which run through the middle of the Kingdom, from Cumberland to the Landsend, in a somewhat curved direction westward, turn aside the bleak north-east winds which sweep along the frozen continent of Russia, Poland and Germany, from the further Tartary and the sea of Otchakof, giving them a south-westerly direction down the coast of the Channel all the way to Cornwall; while the vale of the Severn, the low lands of Somerset and Gloucestershire, are protected by the intervening high lands of Wiltshire, Hampshire, and Dorset, and thus escape, in part, their frigorific influence. So striking has the effect of this geographical barrier been sometimes observed to be, that invalids and valetudinarians who resorted to Devonshire for mild winter quarters, and who felt well and comfortable during the proper winter months, have been com-

pelled to run for their lives, when the chilly and parching March winds began to blow, and have sought shelter at Bristol or the Hotwells, where they have described the difference in the temperature and constitution of the atmosphere, according to their sensations, to be very decided.

It has already been mentioned that Bristol stands upon both sides of the Avon. This river enters the city from the south-east, and pursues a very tortuous direction till met by the Froom, opposite to Cannon's Marsh, a little to the south-west of the Cathedral; the latter river has an equally winding course through the city from the north-east, tending southward, to the confluence just indicated. This description, however, is more applicable to the former course of these rivers than to the present, because a considerable part of the channels just traced has, of late years, been converted into a floating harbour, to avoid the inconvenience of the tides; the whole, indeed, of the course of the Avon, and a small extent of the Froom have been so converted. This work was effected by damming up the entrance of the former river, and cutting a new channel for it to the south of the city. The gates of the harbour are not far from the Hotwells. The distribution of the stream of the Froom will be spoken of by and bye.

The geological situation of Bristol is upon the western frontier of the coal basin which bears its name. This basin forms an irregular triangle, the apex of which is near Tortworth, in Gloucestershire, the base extending from the vicinity of Frome along the chain of the Mendip Hills to the Bristol Chan-

nel, a short distance below Weston-Super-mare. The rock of which it is composed, may be seen, also, in the Holm Islands, which lie in the channel nearly opposite to Weston. Those who have the slightest knowledge of geology, will not need to be reminded that while the mountain or carboniferous limestone forms the outer shell, as it were, of a coal basin, it is lined within by the rock called millstone grit, immediately upon which the other coal measures are arranged, consisting, in this district, of lower coal shale, pennant, and upper coal shale. Over these inclined strata lie the horizontal beds of dolomitic conglomerate, new red sand-stone, and lias; and, according as the latter have been removed by various denuding agents or convulsions, the former are exposed. On taking a survey of the tract of country immediately surrounding Bristol, we observe an irregular plain, bounded to the west by the mountain limestone and millstone grit, to the north by the lias, to the north-east and east by pennant, and to the south by lias again. The basis of this plain is composed of red marl and new red sandstone. We shall speak more particularly of the soil which covers it, after describing the city and suburbs in relation to this and the other rocks.

The highest and most picturesque parts of Clifton are on the mountain limestone. This rock extends along the defile of the Avon on both sides, constituting, on the northern bank, St. Vincent's Rock, and after an interruption of dolomitic conglomerate, of small extent, stretching over Durdham-down, and on to Cook's Folly, below which it is seen to rest on the old red sandstone. On the cliffs formed by this

rock, along the southern bank of the river, hang the beautiful Leigh Woods. Below Prince's Buildings and the York Crescent, which stand upon the mountain limestone or superjacent limestone shale, we find the millstone grit, which may also be seen on the other side of the river, reposing upon the limestone. All the lower part of Clifton, including the Hotwell Road, and some very high ground, for instance, that of the Paragon and Windsor Terrace, are built upon this rock. Proceeding in a north-easterly direction, we find it over Brandon Hill, Tyndal Park, the upper part of Park-street, and at the foot of St. Michael's Hill, where it disappears under the superincumbent red sandstone and lias. It is not easy to determine, precisely, the boundaries of the millstone grit, as the ground below the parts just enumerated is thickly covered with buildings, and no other outcroppings are visible than at the places just mentioned. As the distance between the known course of these strata and those of the red sandstone is by no means great, the determination of the boundaries is not of much importance. The remainder of Bristol, that is, about three-fourths, is situated on the red ground; from this, however, we must except a small portion north of St. Michael's Hill, which belongs to the lias.

The general character of mountain limestone is too well known to require description here. Elevated to a considerable height, inclined in its stratification, and covered with a shallow soil, it presents obvious advantages with respect to perflation of buildings, and non-detention of moisture on the surface; but, on the other hand, the hardness of its texture is a

serious inconvenience in the formation of sewers. The water which it yields is good, but, on boiling, becomes milky in appearance, from the carbonate of lime held in solution. From this rock issues the spring at the Hotwells, so much resorted to by invalids in former times. Its temperature is 74° Fahrenheit, and its specific gravity 1.00077. Each pint contains

Carbonic Acid, ...	3.5	cub. in.
Carbonate of Lime, ...	1.5	grs.
Sulphate of Soda, ...	1.5	
..... Lime, ...	1.5	
Muriate of Soda, ...	0.5	
..... Magnesia, ...	1.	
	6.0	

The water obtained from the millstone grit is, for the most part, extremely pure. It occasionally, however, puts on a different appearance, from being tinged with iron, which abounds in this rock. The grit is a compact silicious stone, and contains large quantities of quartz crystals called Bristol Diamonds, which are six-sided pyramids, frequently deposited on needles of iron, or manganese, or sulphate of strontia.

We shall not attempt any account of the other coal measures, as no part of the city is built upon them. They do not occur within a shorter distance than a mile and a half or two miles. For the same reason we shall pass over the next in order to these, or the dolomitic conglomerate, the first of the unconformable strata.

A section of the new red sandstone is seen just below St. Augustine's Church, on the northern side of the floating basin, or old bed of the river Froom. Another, admitting still better of observation, is in the new cut of the Avon. This stone has been much used in building, but is too deficient in durability for the purpose, a fault which may be seen in the walls of the cathedral. Of the medicinal character of new red sandstone, a very good account has been given by Dr. Henry, when speaking of this formation as it occurs around Manchester, and we shall therefore quote his words.

"The only principles on which the strata of any district lying beneath the soil and superficial beds of clay and gravel, appear capable of exerting an influence over the health of its inhabitants, are—as those strata absorb water more or less readily and completely, thereby affecting the hygrometrical state of the atmosphere; and as they furnish, by springs and rivers, water more or less impregnated with foreign ingredients, and therefore less or more fit for the use of man. Under the first view, the red sandstone is well adapted, by the avidity with which it imbibes water, to moderate the evils of a rainy climate like that of Lancashire. Under the second aspect, this rock furnishes an abundant supply of beautifully clear water, agreeable to the palate, but holding, in solution, much carbonate of lime, and a little sulphate of that earth, both of which are deposited on boiling. There is no reason to suppose that these impregnations have any effect unfavourable to health. They can have no tendency to produce calculous diseases, which were once imputed

to them, but which have been shewn to be produced by causes quite independent of the qualities of water, and to depend on morbid operations of the animal economy. The almost universal freedom of the red sandstone from noxious metals (lead and copper being rarely found in it,) adapts it for the purpose of an excellent natural filter. By its spontaneous decomposition, also, this sandstone is known to furnish an excellent sandy loam, one of the most desirable that can be found for the production of every vegetable; and in this manner it cannot but materially contribute to the salubrity of any country, of which it is the prevailing rock."*

In a medical point of view, the soil and subsoil are, perhaps, of more importance than the subjacent rock. In some parts of the low ground on which Bristol stands, the sandstone is merely covered with red loam or earth; in others, there are large deposits of alluvial clay, and peat, filling up the hollows in the sandstone. The clay is of a blue colour, and from 10 to 20 feet thick. Dr. Bright† says that, on digging the channel of the New River, a bed of peat, 2 feet thick, was found, 12 or 14 feet below the surface. From the geographical account which has been given of the distribution of the rivers which intersect the city in so many directions, it might reasonably be inferred that there must be a considerable extent of alluvial matter corresponding with their course, and this is found to be the case. Thus the principal part of Temple Parish, St. Philip's, St.

* See a paper by Dr. Lyon, on the Medical Topography of Manchester, in the North of England Medical and Surgical Journal, No. I.

† Geological Transactions, vol. iv.

Paul's, the southern part of St. James', including Broadmead and Lewin's Mead; that division of St. Augustine's which is situated between College Green and the southern base of Brandon Hill, on ground redeemed from Cannon's Marsh; Queen's Square, and its vicinity, which lie between the two rivers; are all built upon soil more or less argillaceous.*

The buildings in Bristol, as it respects both their mode of construction and their relative situation, present no very marked difference from those of other large cities of a date equally antique. In consequence of the abundance of stone-qnarries in the vicinity, even the poorest tenements, as far as the walls are concerned, afford good shelter from inclement seasons and atmospheric vicissitudes in general. Ventilation, however, is by no means so well provided for. The streets are, for the most part, narrow, and the houses of considerable height, and in those parts of the city inhabited more especially by the lower orders, we find courts and close alleys very frequent. As if the original object had been to make every inch of ground available, houses may be observed in some of these courts, with their faces opposed to each other, at the distance of five or six feet only, the entrance to the area being under an archway from some street, only a little less confined than the court itself. On looking at them, and considering the filthy, careless habits of the occupants, the medical observer is puzzled to imagine how any degree of health can be pre-

* For a full and luminous view of the geology of the neighbourhood of Bristol, the reader is referred to a paper upon the Bristol Coal Basin, by Professor Buckland and the Rev. Mr. Conybeare, in the Geol. Trans.

served, in places where exhalations from the soil, and every description of human miasmata must be almost constantly detained and concentrated. Narrow passages are sufficiently unhealthy, but they have greatly the advantage of the courts to which we refer, since, in the former, there are, for the most part, two open extremities which allow a pretty free current of air, while in the latter, all perflation is obstructed by the quadrangular arrangement of the buildings. When it is borne in mind that the areas are often half-filled with deposits of the refuse of animal and vegetable matters, as well as with other impurities, it must be evident that few circumstances are wanting for the production of all the morbific agency of which buildings are capable. But even those parts of the city formerly tenanted by the wealthy citizens, seem to have been as little exempt from the character of closeness as those which gave shelter to the more needy. The truth of this statement is strikingly confirmed by the name of Broad-street. What must have been the width of the other streets when this received its distinctive appellation!

In the important particulars of drainage and sewerage, some districts of the city suffer great disadvantages. Before the floating harbour was constructed, every facility was afforded for the removal of filth, by the unobstructed course of the rivers; but after the accomplishment of that work, the accumulation of the matters discharged by the drains in a stagnant body of water, occasioned no slight inconvenience to the citizens for many years. It is proper, however, to mention that, previously to the formation of the floating harbour, those parts of the

city which stand upon the banks of the Froom were liable to serious inundations, the effects of which were highly prejudicial to the inhabitants. These floods took place whenever there was a concurrence of the three following events :—a sudden dissolution of snow, a spring tide, and a south-west wind blowing up the Bristol Channel. Within the last few years it has been customary to empty the float twice annually, and a large sewer has been formed, which runs from the embouchure of the Froom in a direction parallel with the Float, and after receiving the drains from the central parts of the city, discharges itself into the new channel of the Avon. Into this sewer the Froom sends a division of its stream, loaded with the contributions which it has received at every step of its progress through some of the most closely built and densely crowded districts. Unhappily, the current of this river is narrow, torpid, and scanty, in consequence of which it often struggles ineffectually with the burthens accumulated upon it, and deposits them upon its bed, the sides of which become elevated into pillows for the exhausted and almost stagnant waters, and exhale miasms sufficient, it might be imagined, to infect the whole neighbourhood. In the summer time we have seen the stream shrunk to a width, scarcely exceeding that of a large gutter, and trickling between two mounds of mud. At all times it is almost impossible to cross the bridges by which it is concealed from sight in the midst of streets and lanes, without being reminded by particular odours, of its propinquity. Great and highly commendable pains have been taken by the proper authorities for the mitigation of this evil, and

certainly the annoyances, although still considerable, are much less so than in former times.

As there is no staple manufacture in Bristol, the occupations of the working classes are very various. There are, however, as might naturally be expected in a city of such magnitude, many extensive manufactories, which give employment to a large proportion of the population. The most numerous of the trades prosecuted upon a large scale, are those which depend upon the port; such are the building and fitting-up of vessels, rope-making, chain and anchor works, &c. From the connection of the place with the commerce of the West Indies, sugar-refining occupies a conspicuous place among our local manufactures. Glass-works are carried on to a great extent; so, likewise, are tanning, and the manufacture of soap, glue, parchment and floor-cloth. There are no employments here which exert a specifically injurious influence upon the constitution, excepting the preparation of white lead and flax dressing. In some of the occupations which we have mentioned, such as glass-blowing, iron-working, sugar-baking, &c. there is, of course, a frequent risk of contracting those disorders which result from exposure to alternations of temperature, but it does not appear that the operatives in these trades are shorter lived than others. It would be out of place to dwell here upon the agency of these employments, in a medical point of view, since they are not so prevalent in, or peculiar to, Bristol, as to hold any prominent place in relation to its healthy or morbid character. Each of them must, of course, contribute to the aggregate of disease, but cannot be considered

with reference to the population, in the same important light as the needle-grinding of Sheffield or the cotton-spinning of Manchester. With regard to the workmen engaged in the various preparations of shipping, we are inclined to think that their labours are rather conducive than prejudicial to their health, since, on the one hand, they are not subject to long or close confinement, nor, on the other, are they too much exposed to the atmosphere; in addition to this, their occupations are, for the most part, the reverse of sedentary, and yet are not attended with inordinate or exhausting exertions. On the whole, then, we are decidedly of opinion that the occupations of the population of this locality, bear but a small proportion in the causes of disease, if we compare it with other cities peopled to an equal amount.

The kinds of subsistence used among the lower classes, are constantly varying with the demand for work and the rate of wages. When the latter are not very low, the families of the poor contrive, for the most part, to obtain animal food three or four times a week, but the meat is generally bacon. When they are unable to procure meat, the mid-day meal generally consists of boiled potatoes, or, almost as frequently, of tea with bread and lard. It is to be regretted that the prejudice against oatmeal is almost universally prevalent in this district, and that the deficiency of other articles is not supplied by porridge. Occasionally the fish-market is overstocked, and the poor have then an opportunity of purchasing herrings, mackerel, and such kinds of fish, at a very low rate, but too often not till the delay in the sale

has occasioned the commencement of putrefaction. We have been informed that frequently late at night they are tempted to buy tainted meat, which the sellers did not dare to expose in their shambles by day, at two-pence per pound; and that in the like manner the farmers in the neighbourhood occasionally dispose of the carcases of cattle which have died of disease. In certain obscure districts we have had the pain to see meat hanging in the shops, black in colour and almost liquid in consistence. When to such examples of diet we add the sweepings of greengrocers' stalls, which are often insufficiently boiled for want of fuel, some idea may be formed of the innutritious, or even noxious, character of the aliment on which a large portion of the populace subsist. To those who happened to witness the avidity with which the allowances of rice and gruel (neither spiced nor sweetened,) were sought at the time of the prevalence of cholera, when these articles were largely distributed, no further proof was wanting of the scarcity of the necessaries of life. Great as are these evils, the lot of the poor half-fed people would be comparatively happy, if the practice of spirit-drinking were not prevalent. No tongue can tell the miseries induced by these poisons among the unthinking wretches, who often resort to them at first for the relief of gnawing hunger, and the fancied obviation of the results of deficient clothing. All their unavoidable ills are increased a hundred-fold. The evils of a spare maintenance might be to a certain degree endurable, with bodies not subjected to worse agencies, with passions under control, and with families peaceable and well-regulated; but such

supports or alleviations are unknown among the votaries of ardent spirits.

Wherever food is deficient, it may be safely concluded that there is a still greater scarcity of clothing among the indigent. The physiologist has no need to try experiments upon the capability which the human system possesses of resisting low temperatures, when he can enquire into the circumstances of a poor population during an inclement season. We have often been astonished at the minimum of clothing to which individuals in these ranks reduce themselves, when pressed by the calls of hunger, far more imperious than the urgencies of frost and snow. In the winter of 1831 and 1832, when engaged with others in enquiries into the condition of the poor, with a view to arm them, if possible, against the threatened pestilence, we frequently found a family of five or six persons with one threadbare blanket between them, and the mother with a single flannel petticoat in the same predicament; all other articles of warm covering having been long before bartered for food, or deposited at the pawn-brokers.

It would be difficult to designate the miserable creatures reduced to this degree of destitution, as belonging to any particular class. They are such as may be found in almost every populous district; in this place they consist principally of unemployed labourers, artisans, and seamen, among our own people, and of hordes of Irish adventurers, whose existence seems to have no other object than that of showing upon how little extraneous material their athletic frames can be maintained, and how little derived from outward sources of enjoyment is the current of their happy spirits.

We must not dismiss this part of our subject, without alluding to the manner in which the dwellings of the working classes are occupied. If the enquirer into the condition of the poor is amazed at their achievements in abridging the necessaries of life, he will experience no less surprise at the ingenuity which they manifest in accommodating crowds of living beings in a small compass. And in this art our Hibernian brethren maintain their supremacy. It is a common circumstance for a house to be tenanted by five or six families. In their arrangements there are many grades of landlords or letters; thus, one individual, not much higher in the world than his tenants, rents the entire house of the landlord, and lets the floors to other individuals, who, in their turn, let single rooms to families or single persons; the latter, also, have their tenants, who hire corners in the room. We have found thirteen individuals, men, women and children, living promiscuously in one garret of no very large dimensions. On one occasion it happened to us to discover that thirty individuals had, on one night, slept in a room, the measurements of which did not exceed 20 ft. by 16. The people thus congregated were Irish; they chanced to be on their way from London to their native country. At that period cholera was hovering over us, and on the night to which we refer, it swooped down on nine out of the thirty, and seven became corpses in the course of a few hours. By mentioning the latter fact in this connection, we do not mean to intimate that the accumulation of so many individuals in a small space, was the only cause of the terrible incursion, for they were under the

scarcely less noxious agency of a loathsome diet. Many other instances of crowding fell under our notice at the same time; among others, we had once the pain of seeing, in a confined chamber, three persons labouring under the same malady, who could only find room for the extension of their bodies by lying with their heads in the several corners, while their feet met in the centre of the floor. A great variety of such details might be collected, but they would swell this paper unnecessarily. What has been mentioned will suffice to shew, that although Bristol is exempt from many morbific causes to which other large cities are subject, yet she has her share of those common sources of disease, want and wretchedness.*

Of the moral habits of the people, it is difficult to speak with any degree of precision, and I am doubtful whether any thing more specific can be stated, than that where so much indigence exists, its offspring, vice and ignorance, must also abound. Dr. Chisholm remarks, that he had much satisfaction in observing the regularity with which the poor of Clifton and the Hotwell-road, attended to their reli-

* In the out-parish of St. Philip and Jacob, all the evils of squalidity, united with destitution of comforts, seem to have attained their utmost limits; yet, strange to say, the health of the inhabitants would appear to be comparatively little affected by this circumstance. Typhus is but seldom observed in the parish, or any other of the diseases commonly referred to the influence of filth and the congregation of human beings in a narrow space. This fact, however, agrees with what we are told of the general immunity of certain savages, such as the Esquimaux and Kamschatkans, from pestilential diseases; but, although the loathsome habits of these tribes are not capable of generating poisons, yet, when the morbific cause is applied, its effects are much greater than in a population better circumstanced.

gious duties on Sundays.* We fear that there has been some degeneration, in this particular, since the time of Dr. Chisholm.

In reciting the morbid history of a locality, the first and most prominent topic would naturally be an account of the endemial diseases. But on looking over the catalogue of maladies at our charitable institutions, and taxing our own experience, we cannot fix upon any individual affection, or any classes of affections that can be said to prevail in Bristol more than in other places. This conclusion, indeed, might have been anticipated from the foregoing pages, wherein it appears that our population, though exposed to the morbific agencies common to all populous cities, has no specific causes to contend with. Thus the statements which have been made respecting the geology of the district, will have prepared the reader for the announcement, that the disorders originating in malaria, such as intermittent and remittent fevers, are known to us only among persons who have immigrated hither from fenny countries.† Dysentery, when it occurs, appears either in sporadic cases only, or as the result of an epidemic constitution of the atmosphere. Calculous diseases are not so prevalent as to lead the medical observer to refer them to any local peculiarities of diet. Nor are we aware of any modification of the types of those diseases which are derived from common

* Statistical Pathology of Bristol and Clifton.—Ed. Med. and Surg. Journ. vol. xiii.

† The nearest marshes are in the vicinity of Compton, Henbury, Cross, and Bridgewater.

causes, sufficiently notable to induce us to assign them to the operation of topical circumstances. It has already been observed, that there is no one prevalent trade that exerts any appreciable influence on the health of the community.

Hence it follows that we must content ourselves with making a few remarks upon some of the diseases which owe their origin to causes not peculiar to the place. Of these the most frequent are pectoral, gastric, and rheumatic affections.

Bronchitis has, in our experience, far surpassed in frequency all other pulmonic maladies of an acute description. We are bound to attribute this fact, in a great measure, to atmospheric influence, though it is not easy to determine what condition of the air has a preference for bronchitis, over pneumonia or pleuritis, unless it be allowable to conclude that, while the former disease is, for the most part, the result of a morbid stimulant, directly applied to the mucous surface, the latter are more generally referrible to a causation, compounded of deranged sanguineous determinations and remote sympathies; not that we imagine bronchial inflammation to be exempt from these influences. If this be granted, it is not difficult to conceive of states of the atmosphere, of a chemical or specific character, which might be quite adequate to the excitement of bronchitic disorder, without those alterations of its temperature, which tend to disturb the equilibrium of the circulation, and to accumulate the blood in the parenchyma of the lungs, or to effect those derangements of the cutaneous function which provoke the irritability of serous membranes. Certainly pleurisy, more

commonly than any other active inflammation of the chest, succeeds sudden transitions from heat to cold. In Naples, as we are told by Dr. James Johnson and other writers, this disease is endemic, and is very reasonably attributed by them to the chilling tramontanes, which are constantly surprising the inhabitants enervated by sultry skies and siroccos. It is possible that the foreign particles abounding in the air of Bristol, may have something to do with the frequency of bronchitis. We seldom find this disease fatal in its acute form, when judiciously treated, but it is very prone to pass into the chronic form, and then becomes extremely intractable.

Of the chronic diseases of the lungs, phthisis maintains its predominance here as elsewhere. Sometimes it supervenes on acute inflammation of the bronchial membrane, or of the pulmonary tissue, but far more frequently it takes its origin solely from the peculiar structural degeneration in which its essence consists. Our consumptive patients often, indeed, with that confidence and self-delusion which characterise the disease, refer their complaints to some accidental occasion of taking cold, suffering "a chill," exposure to rain or fog, and similar causes, fancying that their symptoms are consequently of a less serious description; but on close cross-questioning, it generally appears that, for some time prior to the date, which they would fain assign to their indisposition, they had experienced an acceleration of breathing on any increase of exertion, had been sensible of a slight oppression on the chest in the recumbent posture, had been troubled with a short cough, and had even expectorated small quan-

tities of blood. Their friends, also, when reminded by our enquiries of observations which they had formerly made, though without reflecting upon them, will tell us that they remember having occasionally noticed an alteration of the complexion, a "faded look," that a loss of flesh had certainly taken place, and that the intonation of the voice had been, in some measure, changed; all these circumstances not having been striking enough to detain attention at the time, though sufficiently impressive to be remembered afterwards. Now all these symptoms indicate the commencement of a morbid action prior to the bronchitic or pneumonic seizure; but the action is just such an one as readily invites the operation of inflammatory causes, and this is the reason we imagine why persons, both in and out of the profession, are so disposed to look upon tuberculous deposits as uniformly the results rather than the causes of phlogistic action. We are by no means so exclusive as to maintain that tubercles always take their very beginning in a derangement *sui generis;* on the contrary, we are of opinion that very frequently inflammation is the first of that series of capillary aberrations, which terminate in the substitution of tubercular for the proper interstitial secretion; in other words, that inflammation developes the peculiar diathesis. Perhaps the declaration of this opinion may appear irrelevant here, unless we can offer any grounds for it, derived from circumstances more immediately connected with this locality. We are, however, not aware of the existence of any such circumstances. It might not unnaturally be conjectured that scrofula is so prevalent here,

that the frequent occurrence of phthisis, in persons who have this form of cachexy strongly marked, has led us to believe in its non-inflammatory origin. But we are disposed to assert our attachment to this view, the rather because such circumstances as we have hinted at, are by no means more common here than in other large cities, where many of the inhabitants are compelled to struggle with the injurious influence of close air, bad or scanty food, and squalid habits; and, consequently, our opinion is founded on the general history of the disorder in question.

Rheumatism is a most prolific parent of cases in this locality, but does not, as far as we have been able to determine, present any peculiar characters. Both in the acute and chronic form, it appears such as we have observed it elsewhere, whether with reference to the constitutional affection, the parts most frequently attacked, its sequelæ, or its amenability to remedies. Correspondently with its remarkable frequency in this place, we meet with a large number of cardiac cases, particularly pericarditis, hypertrophy, and disease of the valves. Simple dilation, which has no immediate connection with rheumatism, is of more rare occurrence.

Next to rheumatism in the order of frequency, we must place those gastric derangements which pass under the denomination of pyrosis, gastralgia, morbid sensibility of the stomach, &c. It very seldom happens that a patient complains of a gnawing pain in the stomach, without also mentioning that he is subject to the ejection of a clear glairy fluid. There is often tenderness at the epigastrium, but the tongue, which, for the most part, assumes a pale,

pasty, sodden look, occasionally, however, presenting nothing uncommon, has very rarely the red tip and margin, indicative of mucous inflammation. It is true that leeches, generally, give temporary relief, but they appear to do so in the same manner in which they alleviate pains of a spasmodic or neuralgic character. Purgatives, followed by subnitrate of bismuth, and, occasionally, by acetate of morphia, seldom fail to cure the disorder for a time; but it returns unless the cause be removed, which is, unquestionably, the use of indigestible irritating articles of food. The triple use of potatoes, tea, and gin, will reduce the hardiest stomach to the painful condition we speak of. The great frequency of the disorder in Bristol, evidently results from the poverty of the people, and its relation with alimentary causes.

Omitting the febrile exanthemata, together with infantile remittents, and diseases connected with dentition, which constitute so large a proportion of medical cases in all parts of the kingdom, we find, among the most frequent of our patients, females labouring under some form or other of hysteria, considering this term as generic for all those neurotic, atonic, anomalous ailments, to which females are so obnoxious, and which are all less or more related with catamenial deficiencies and disturbances. To attempt to specify them is vain; no cases preserve so much individuality, united with so much family resemblance. Numerous as they seem to us, we by no means imagine that they are eminently so; for their very nature and causation intimate that they must be prevalent wherever a great variety of moral stimulants are in operation, as, for instance, in a crowded population.

Fever has, in all ages and countries, manifested such close relations with local peculiarities of air and soil, that to omit the consideration of it in reference to the subject of our remarks, would be altogether unjustifiable. It is unnecessary to repeat our former statement, that regular periodic fevers are unknown as indigenous productions. Continued fever is common enough, but nine-tenths of the cases are of a simple character, terminating, for the most part, within seven days, and uncomplicated with anything more serious than slight catarrhal or rheumatic disorder. Those cases which are longer in their duration, and assume a more serious aspect, have inflammatory complications, which render the terms cephalic, bronchitic, gastro-enteric, appropriate adjuncts. But typhus gravior is rare, much more so than might be expected by those who consider such circumstances, as accumulation of filth, ill-ventilation, bad diet, putrid effluvia, to be capable of generating this form of fever. Even the fever that does occur in this locality, indicates but a very slight relation with such causes as have been just enumerated. It has often been observed to be infrequent, or altogether absent, in the most crowded and dirty parts of the city, at times when it was prevailing considerably in institutions and dwellings where cleanliness and free air are most carefully attended to. Of the various local circumstances with which it has been connected, the most frequent has appeared to be a moist argillaceous soil, such as is found in certain parts of the parishes of St. Paul and St. Augustine. In the post-mortem examinations of febrile cases, ulceration of the mucous membrane

of the bowels is the most common morbid appearance.

Consistently with the infrequency of the low or malignant typhus, we seldom observe that inflammatory affections of the head, the lungs, or the abdominal viscera, have a tendency to assume the type designated after this form of fever. The same may be said of the exanthemata.

The following is a classification of 700 medical cases treated in the Bristol Infirmary, in the year 1832, for which we are indebted to our very intelligent friend Mr. Morgan, late house-surgeon to that institution.

Diseases of the Organs of Digestion,.....	73
..... Respiration,...	117
..... Circulation, ...	26
.....of the Nervous System, ...	58
.....Urinary Organs,.....	6
....Generative, ...	26
Febrile Diseases, ...	171
Rheumatic, ...	117
Dropsical,..... ..	22
Cutaneous, ...	27
Miscellaneous, ...	57
	700

We shall now proceed to offer one or two statements relative to the ratio of mortality in this district, which we are the better enabled to do through the assistance of some original tables, kindly furnished us by Mr. Rankin, Actuary to the Bristol Union Fire and Life Insurance Company. This gentleman was at the pains of consulting, a few years ago, the various registers of burials in the city and out-parishes, in order to ascertain the numbers and

respective ages of all who had died in a period of ten years; viz. from 1813 to 1822 inclusive. By means of the results thus obtained, Mr. Rankin was enabled to calculate the expectations of life at the several ages in this locality.

TABLE I.

Total of Burials in the City of Bristol and Bedminster, from 1813 *to* 1822 *inclusive.*

All Saints, Christ Church, and Cathedral, ...	279
St. Augustine,.....	1183
St. James, ...	1834
St. John, ...	137
St. Mary Redcliff, ...	1330
St. Mary-le-Port, ...	128
St. Michael, ...	1109
St. Nicholas, ...	286
St. Paul, ...	851
St. Peter, ...	259
St. Philip and Jacob,.....	2437
St. Stephen,.....	352
St. Thomas,.....	263
St Werburgh, ...	54
St. Mary (Bedminster,)	1265
Temple or Holy Cross,.....	1903
Total from Parish Registers, ...	13670
Total from Dissenters' and Private Burial Grounds	6896
Grand Total in 10 years, ...	20566

If we divide the whole mortality stated in the above table by 10, in order to obtain the average annual number of deaths, and make the result the divisor of the population,* the ratio of mortality will be about 1 in 45. In London the ratio is 1 in 40; in Liverpool the same; in Birmingham 1 in 43.

* The population of Bristol and the Out-parishes, is 92434.

From another table we have selected the following statements of the expectations of life, to a person at the age of 20, in different places; these, it will be seen, are highly favourable to Bristol and Clifton.

London,	29.37
Northampton,	33.43
Bristol,	33.17
Clifton,	35.28
Chester,	36.48
Philadelphia,	29.61
Breslaw,	34.15

A third table acquaints us with the number of persons living at the age of 20, out of 1000 born, in the following places:—

London,	325
Northampton,	440
Bristol,	509
Clifton,	539
Breslaw,	461
Vienna,	287
Berlin,	324

From another table which Mr. Rankin was so obliging as to lend us, we have calculated the annual number of deaths at certain periods of life, in this city, which are as follows:—

Ages,	1	21	40	50	60	70	80	90
Deaths,	371	15	25	25	31	29	21	4

It is to be lamented that, in consequence of the present mode of keeping public registers, the first table does not afford us such valuable results as might otherwise have been derived from such a document. The deaths being registered at the places of *burial*, no estimate can be formed of the propor-

tionate mortality of a parish, from an inspection of the register in that parish, because a large number of the inhabitants may have been interred in other parishes, or in private burial-grounds, or in those attached to dissenting places of worship. As a proof of the great inaccuracy that would accrue from a calculation founded upon parochial registers, the number of interments stated to have taken place in the parish church-yard of St. Philip and Jacob, would give a ratio of mortality amounting to no more than 1 in 82, to the most ill-fed and ill-clothed portion of the population of Bristol. If deaths, instead of burials, were registered, and in the places where they occur, information of the most important kind might be deduced from them, relative to the comparative salubrity of particular districts. We trust that this change, together with many others greatly needed in the system of registering, will, ere long, be effected by the legislature.

A TOPOGRAPHICAL ACCOUNT

OF

STOURPORT, WORCESTERSHIRE,

AND ITS

IMMEDIATE NEIGHBOURHOOD.

BY KENRICK WATSON, ESQ. SURGEON.

Description of the Town, &c. &c.

STOURPORT is situated in the hamlet of Lower Mitton, the parish of Kidderminster, and the county of Worcester, and is distant eleven miles from that city. It is bounded on the south by the river Severn, on the east by the Stour, on the north by the hamlet of Upper Mitton, and on the north-west by part of the Foreign of Kidderminster. It is distant 122 miles from London, and about 100 miles from the nearest part of the coast. Its height, above the level of the sea, is 58 ft. 7 in.* Its longitude is 2° 10′ W., its latitude 52° 24′ N. The river Stour rises in the celebrated grounds belonging to the Leasowes, near to the town of Hales Owen. Its waters are considered to be excellent for all the processes of dyeing, and a

	ft.	*in.*
* Level of Canal is, above the low water mark at Liverpool,	99	7
Bank of Severn at Stour Bridge is, above low water at Liverpool,	58	7
Rise,	41	0

great number of forges and mills are connected with its stream. After a course of above twenty miles, it empties itself into the Severn, immediately below Stourport. In 1661, an act was obtained for the purpose of rendering the Stour navigable, and in 1666, a person named Yarrington was sent to Holland to learn the art of inland navigation; upon his return, he made the Stour navigable between Kidderminster and Stourbridge, but there was then so little want of such a communication, that the river was soon choked up, and the boats allowed to rot as being useless.

The Severn, during the summer, is a very shallow stream, but the channel is deep, and the banks are high, on account of its running generally through a light sandy soil. It is navigated, however, at all times of the year, (except when the season is very dry,) from Bristol to Shrewsbury, and even to Welsh Pool; the tide is not generally felt higher than Upton. A horse towing-path has been made within a few years from Gloucester to Shrewsbury. The Staffordshire and Worcestershire Canal, to which the town owes its rise, and the immediate neighbourhood its prosperity, was completed in the year 1771, and in 1775 a bridge was built over the Severn, connecting the town with the parish of Areley Kings, by which means a new line of communication was opened between the manufacturing towns and those agricultural districts upon which they depended for their supply of corn, cattle, hops and fruit.

By these means, the town enjoys a perfect facility of communication with all parts of the kingdom, and forms an *entrépot* for the agricultural produce of

the adjoining counties, the manufactures of Lancashire and Birmingham, the mineral productions of Wales, Shropshire and Staffordshire, and for the colonial imports from the different parts of the world

Stourport (of which Mitton, the original or old town, may now be considered as a street,) contains 567 inhabited houses, of which 162 are of the annual value of 10*l.* and upwards, and the population, according to the last returns, was 2952. Males, 1446; females, 1506. The average number of baptisms and funerals for the last three years, is, baptisms, 103; funerals, 66. The number of marriages cannot be ascertained, since persons resort to Kidderminster most commonly for the ceremony.

The houses are built of brick, and are, generally, very warm and comfortable, but the yards are small and confined. The usual rent of a small house is about seven pounds. With the exception of the principal streets, the drainage is imperfect, and the privies and pig-sties are in an offensive state. Vessels full of pig-wash are frequently kept close to the doors, and, sometimes, within the houses, but I am not aware that any extensive disease has been ever produced by these nuisances.

The mud from the canals and basins, which consists principally of clay mixed with sand, more or less coal-dust, and a very small portion of animal and vegetable matter, is frequently allowed to remain in different parts of the town, for many weeks, until it is dry enough to be removed, but I never observed any disease arise from this cause.

The labouring classes in the town are generally in comfortable circumstances, and their wages are

good. Bargemen, when on a voyage, get an unlimited allowance of animal food and beer, with bread. They are generally stout powerful men, and though exposed to great hardships during their voyages, they appear to be very susceptible of cold when at home. I observe that they exclude every breath of air from their bed-rooms, cover themselves with a heap of clothes, and never seem so comfortable as when they are in a profuse perspiration. They commonly eat their meat broiled, with bread, but very seldom use vegetables. They receive about thirty shillings for a voyage to Stroud, besides their meat and drink. The length of time required for the voyage varies with the wind and tide, but the average may be from seven to fourteen days.

The canal boatmen are a much more feeble class of men, and live much more upon vegetables. They are usually accompanied by their wives, and, occasionally, their whole family live in the boat, but the majority of them have houses in Staffordshire. The wages usually paid for a voyage to Bilston, which is thirty-two miles distant, are twenty-five shillings. The time required for the journey is three days, but they are frequently detained many days before they can get coal. The boatman finds his own provisions, and, likewise, a boy, horse, and lines. They are a drunken race, and many of those who are not in regular employ, are considered to be men of bad character. Those who go with the regular trading boats are respectable men. In general, the Cheshire men and their wives are the most cleanly and orderly.

The poor, here, have plenty of coal, indeed, stealing coal is not considered a crime.

The water used for domestic purposes is raised by pumps; it is what is generally called hard, and contains a large quantity of carbonate of lime. The average depth of the wells is about 33 feet. There are two wells in the neighbourhood which are used when a purer water for domestic purposes is wanted; the water of these wells does not appear to contain any mineral impregnation.

About 100 persons are employed in an iron foundry; inflammation of the eyes appears to be the only disease to which they are liable, which can be attributed to their employment.

There is a small spinning mill, at which from 20 to 50 girls are employed; although they work in turn, occasionally night and day, they appear to be very healthy.

There are several benefit clubs in the town; the calculations are, in general, badly made, and there is much reason to fear that those members who may live to be old, will never derive any advantage from their contributions. Every now and then the box is said to be shut, or, in other words, there are no funds. None of the persons of influence among the men join the clubs, and there appears an objection among them to enrolment.

There are no endowed charities connected with the town, nor any charitable institutions of any extent, except the Sunday Schools.

There is a market on Tuesday and Saturday, and there are two fairs in the year.

By the late Reform Bill, this town was added to the borough of Bewdley, which unites with it in sending one Member to Parliament.

Natural History of the District.

The soil, the produce, and the surface of the country immediately surrounding Stourport, vary very considerably. Within a few miles every variety of secondary formation is met with. The hills, or, rather, the high grounds, which bound the valley of the Severn upon the south, are generally covered with coppice, but timber trees are few in number; oak and ash are the most prevailing kinds of wood; they are generally cut down once in about fourteen years, and are sold for hop-poles and crate-wood, the refuse being burnt into charcoal.

The hills, in this immediate neighbourhood, are sandstone; the level grounds, except where the soil is alluvial, are a bed of sand from twenty to thirty feet deep, then sandstone, and afterwards gravel. Before the country was enclosed, it appears to have been drifting sand for miles round. At the distance of four miles, near Abberley Hills, the sandstone disappears, and limestone succeeds in its stead. When this formation is first met with, it is very soft and impure, and contains very few petrifactions, but, at the distance of eight miles, in the parishes of Witley and Martley, the stone is much harder, and the number of petrifactions much greater. On the south side of the hills, and in the dips between them, the surface is a strong clay, and, at different depths, coal is very generally met with. The coal formation, in some places, commences within a few feet of the surface, but it inclines so much, that the shafts are frequently from twenty-five to thirty yards deep. After the blue clay is cut through, sandstone appears,

of different degrees of thickness, and then a very shallow coal, varying from one to three feet; it is very sulphurous, and, with the exception of what is used in the immediate neighbourhood, is converted into cokes. It seems to be a general opinion among the miners, that there is a deep coal formation, but that the expence of working it would be so great, as not to pay the proprietors.

Some of the springs contain large quantities of carbonate of lime in solution, which is precipitated when the water reaches the surface; occasionally, large masses of tufa are formed.

Vegetation is at least a fortnight later in the clay district than where the sand prevails, but, on the other hand, the autumnal flowers continue several weeks later in the former than they do in the latter.

It is natural to suppose that, in such a varied surface, a variety of botanical specimens would be met with. The following are most of the medicinal, together with some of the scarcer plants:—

Anthyllis vulneraria.
Antirrhinum Orontium.
Arum maculatum.
Atropa Belladonna.
Butomus umbellatus.
Campanula patula.
Campanula hederacea.
Campanula latifolia.
Cardamine impatiens.
Colchicum autumnale.
Comarum palustre.
Conium maculatum.
Convallaria majalis.
Cornus suecica.
Cystea fragilis.
Daucus Carota.
Digitalis purpurea.
Drosera rotundifolia.
Erica Tetralix.
Gentiana Amarella.
Gentiana campestris,
Geranium phæum.
Galanthus nivalis.
Glechoma hederacea.
Helleborus viridis.
Helleborus fœtidus.
Hyoscyamus niger.
Hypericum dubium.
Impatiens Noli-me-tangere.
Lathyrus sylvestris.

Lathyrus Nissolia.
Lathræa Squamaria.
Leontodon Taraxacum.
Lysimachia vulgaris.
Melampyrum cristatum.
Mentha Pulegium.
Menyanthes trifoliata.
Monotropa Hypopithys.
Narcissus Pseudo-Narcissus.
Nymphæa alba.
Orchis ustulata.
Ophrys apifera.
Osmunda regalis.
Ononis spinosa.
Papaver Rhæas.
Quercus Robur.
Ranunculus hirsutus.
Rosa rubiginosa.
Sagittaria sagittifolia.
Sambucus Ebulus.
Sambucus nigra.
Scabiosa columbaria.
Silene anglica.
Solanum nigrum.
Solanum Dulcamara.
Spartium scoparium.
Teucrium Scorodonia.
Ulmus campestris.
Vaccinium Vitis Idæa.
Verbascum virgatum.
Veronica Beccabunga.
Vinca minor.
Viola palustris.
Viscum album.

The missletoe, *Viscum album*, grows in great quantities upon the apple trees; it is found, likewise, upon several other trees, as the ash, the poplar, and the elm, but I have never been able to find it growing upon the oak.

Among the birds which usually prevail in the midland counties, the following are either only occasionally met with, or are mentioned on account of some circumstances connected with their habits which may deserve notice.

Alcedo Ispida.
Ardea stellaris.
Caprimulgus europæus.
Cinclus aquaticus.
Colomba Œnas.
Columba Turtur.
Colymbus cristatus.
Corvus Corax.
Falco Milvus.
Falco Buteo.
Lanius Excubitor.
Loxia Coccothraustes.
Loxia curvirostra.
Perdix rubra.
Perdix Coturnix.
Strix Otus.
Sylvia Œnanthe.
Sylvia Luscinia.
Tetrao Tetrix.
Tringa Cinclus.
Parus caudatus.
Picus major.

In the foregoing list, almost the only bird which requires any particular notice is the nightingale. The banks of the Severn appear to be a favourite resort of this bird, and there is reason to suppose that their number has increased very much of late years in this district, while it is thought, by some naturalists, that they have decreased lower down the Severn. They very rarely proceed further up than Colebrook Dale, and are, I believe, never heard so high as Shrewsbury.

Since so much attention has been paid to the preservation of game, birds of prey have nearly been all destroyed. It is now an unusual thing to see either the kite, *Falco Milvus*, or the buzzard, *Falco Buteo*.

Ravens are likewise rare: in a nest which was built in this neighbourhood a few years since, one of the young birds was a perfect albino; it lived in a domestic state many years, and appeared to possess all the cunning of its kind. The king-fisher, *Alcedo Ispida*, frequently builds here. The common tale of the nest being built with bones is not true in every instance. I have, myself, seen the eggs laid in a hole in a sand bank, which, I conclude, was made either by a rat or a sand martin, and after the young ones were hatched, the sand at the bottom of the nest was found mixed with small bits of bones, the remains of fish which had been eaten either by the old or young birds; whether the bones are to be found before the eggs are hatched, I have had no opportunity of ascertaining. The increase of population, and the great attention which has been paid to the game preserves, has had a similar effect upon

the beasts; the badger and the martin have become scarce, and the fox owes his existence more to the taste for hunting than to his own sagacity.

With regard to insects, in some years they are a perfect plague; the light dry soil of the district is particularly favourable to the different species of the aphis family. The ants are likewise very numerous, particularly the *Formicæ herculaneæ*. In some years, the beetles, and the larvæ of the different Lepidopterous tribes destroy whole woods and orchards. The trees, indeed, rarely die, but, for that year, they neither grow nor produce fruit. The *Scarabæus Horticola, S. Melolontha,* and *S. auratus,* are among the most active. A few years ago, the *S. auratus* increased so much as to cause great alarm among our horticulturists, but they have, of late years, been much less numerous; occasionally, the larvæ of the *P. Cratægi* destroy the hedges to a great extent.

Our rivers produce but few fish which are not found in most others of the same size. Though the Severn has so long been celebrated for its salmon, it is very rarely taken in this neighbourhood. The following are the only species which are not well known in other streams:—

Clupea Alosa.	Petromyzon Marinus.
Corigonus Thymallus.	Petromyzon Bronchialis.

Before the opening of the Staffordshire and Worcestershire Canal, the only communication which existed with North Wales and with the manufacturing districts, was carried on by pack horses, of which, it is said, 400 have been stationed in Bewdley at one time, and afterwards, when the roads were improved, by waggons.

In this manner, Staffordshire and Lancashire, and the country on the banks of the Severn and the Dee, were supplied with West India produce from Bewdley; so complete, indeed, was the monopoly which Bewdley enjoyed, that the tradesmen came from Worcester to buy sugars which had been brought past their own doors from Bristol. The manufactures of Lancashire were brought back to Bewdley, and thence forwarded by barges to Bristol. The roads were so bad, and the difficulty of conveying produce to market so great, that agriculture was much neglected; the meadows were undrained, and so little wheat was grown, that, in one of the neighbouring parishes, the only piece of land which was planted with wheat, was, by way of distinction, called the "wheat pleck." Barley and rye were the principal crops; potatoes and turnips were but little planted; wheat and cheese were procured from Gloucestershire. Very little attention was paid to the cultivation of fruit; the trees were seldom grafted, and the cider which was made, was of a very inferior description, being intended merely for home consumption.

Immediately, however, after the canal and the bridge were completed, things began to improve; by the introduction of the turnip husbandry, large flocks of sheep are kept, excellent wheat crops are now produced, and better sorts of fruit are grown. The cider, however, is still rough, and very far inferior to that which is made in Herefordshire and Gloucestershire. Hops are likewise cultivated in this part of Worcestershire, but not to any great extent, the lighter soil, or rye-lands, as it is called,

not being so well calculated for their growth as the wheat-lands.

About three thousand persons, principally women and children, from the manufacturing districts of Staffordshire, pass over the Severn, about the middle of September, to pick the hops. They are paid about eight-pence a-day, and have their breakfasts found them. In drying the hops, cokes, made from sulphurous coals, are preferred. The great inducement which brings so many individuals so far from home, is to get apples; it may be fairly calculated that each person consumes or takes away two pots or ten pecks of fruit. Some of the pear trees are very large, and will produce forty pots of fruit, which will make two hogsheads of perry. Great quantities of apples are, some years, sent by the boats into the manufacturing districts. In the year 1791, at least three thousand tons were sent; many of them, however, came out of Gloucestershire; the cost of their carriage from Stourport to Manchester would be about £4000. Good fruit, for baking, was then worth ten shillings a pot, and the best table fruit from fifteen to twenty shillings. The price is now from two to five shillings When the price is low, the apples are ground for cider, but there is much less demand for fruit to go to the north than formerly. Except upon the farms where it is made, cider is not the common beverage; in the towns beer is drank as in other parts of the kingdom. The cider will produce intoxication when it is very imperfectly fermented, and, even at the mill, the persons employed in making it are drunk for weeks together. The cider is, occasionally, impregnated with

lead, in consequence of a quantity of the metal being melted and poured in between the stones when they are worn by the friction, to repair the trough of the mill. The smallest quantity of lead in the cider, if constantly drank, will produce colic, but a moderate quantity, occasionally, does not produce any perceptible effect. The perry produced in this neighbourhood, is of much finer quality than the cider, but it requires great care in the fermentation. The cider and perry which are sold by the merchants, are, generally, a mixture of the produce of different years, managed according to the nature of the different kinds produced.

Leases of farms are not generally granted for a longer term than seven years.

With the exception of the parish of Hartlebury, which is copyhold under the See of Worcester, the land is generally freehold. The poor-rates are moderate, and no part of the labourers' wages is paid from the poor-rate, and the tithes are rarely taken in kind.

Diseases, &c.

Formerly epidemic diseases were particularly severe in this parish; during the first part of the last century, typhus fever and small-pox were so fatal, that the farmers were deterred from going to Kidderminster market for fear of the contagion, and so recently as from thirty to forty years since, typhus was frequently epidemic in the neighbouring villages. In the memory of some persons now alive, intermittents were so general that, in the spring and autumn, labourers could not be got to do the neces-

sary work. Since the inhabitants have been better clothed and fed, epidemics have quite disappeared from the rye-land country; intermittents, unless from some accidental cause, are never met with, and typhus, for several years, has been very rare. It occasionally happens that the houses near the Stour are flooded several times in the course of the year, after which, typhus has appeared in these houses; but several years frequently pass without any flood. I have likewise, occasionally, seen typhus very general upon the hills in the coal district, where the water remains a long time upon the surface of the ground, covered, in autumn, by dead leaves, and the cottages are surrounded by trees.

In the rye-lands, glandular diseases are very general. Phthisis is very common, and, in some parishes, there is scarcely a family but has suffered more or less from its ravages. Disease of the mesenteric glands is likewise very general, but the severe external forms of scrofula are unusual: bronchocele is met with in all parts of the country.

The working classes here are bad managers; potatoes, with a very little bacon, or fat mutton broiled, and the fat poured over the potatoes, is their common food; none of the family will touch buttermilk or whey. When the children are weaned, they eat sop; or bread soaked in weak tea with some sugar; and, as soon as they are old enough, they live upon the potatoes and melted fat, and drink water.

The agricultural labourers get from eight to ten shillings a week, and a gallon of cider or beer a day; sometimes they get a small barrel of cider, or brew a

little beer at home, but, in general, the women and children, except among the better class of labourers, are badly off.

Secondary small-pox has been very prevalent of late years but its occurrence has not at all lessened the confidence in vaccination; indeed, I sometimes think the parents are pleased at their children having it.

Calculous complaints are very unusual here, and, in my own practice, they have occurred more frequently among women than among men. During the last ten years, the labouring classes, although comparatively well off, have not been able to procure so large a quantity of animal food, and I think a considerable difference may be observed in the nature of their diseases. Formerly, severe cases of inflammation of the abdominal viscera, particularly of the liver and bowels, were frequent; they are now seldom met with, while, on the other hand, inflammation of the mucous membranes is certainly become much more general.

The mortality in this town, during the year 1832, was very great, the deaths being eighty-two, thirteen of which were from cholera; while, during the first six months of the year 1833, there have been only nine funerals.

In the coal districts, on account of the coal strata being so very thin, the labourers are obliged to lay upon their sides to work, from which cause the spine, occasionally, becomes twisted; but I am not aware that any material inconvenience arises from the deformity. Asthma very frequently occurs among the miners, and many young men are unable to work under-ground from that cause.

Upon the whole, the average of life is very high in the clay districts, but I have been unable to make any thing like a correct calculation of the comparative mortality between the wheat-land and the rye-land districts, on account of the population being insufficient for the purpose, and of the constant emigration which takes place from the distant parishes to the neighbouring towns.

It may, perhaps, be expected that I should give a more particular account of some of the severer forms of disease which occasionally occur in this neighbourhood, though I have nothing in addition to offer as to their treatment, to what is well known to every respectable practitioner.

Acute rheumatism is one of the most severe diseases which we meet with, whether we look to the immediate suffering of individuals, or to its future consequences. I am not aware that it is more frequent among watermen than among those persons who are less exposed to wet and cold, and at least one-half of my patients have been young women. Nor are those persons who are exposed to great changes of temperature in foundries and forges, more liable to rheumatism. I do not, at present, recollect a single case of acute rheumatism among them. I am inclined to think that gout and rheumatism are more nearly allied than is generally supposed, and that both depend very much upon hereditary predisposition. Since the more general introduction of colchicum into practice, rheumatism is much more easily cured than it formerly was. In my own practice, I seldom find it necessary to take away blood. I generally depend upon the

colchicum given in the common purging mixture, with calomel and colocynth in moderate doses till the bowels are freely acted upon, and the secretions become more healthy; after which, I commonly give calomel and compound ipecacuanha powder at bed time, and repeat the colchicum mixture in the morning, till the disease begins to decline or to remit, at which time I begin with quinine, according to the debility and state of the pulse. If the pain or fever should return, I omit the quinine, and give the purging mixture every morning for a day or two, and then return to the bark, &c. In this neighbourhood it is usual to apply scalded leaves to all inflamed joints, and great relief is frequently afforded by the application. I have seldom found it necessary to give calomel so as to affect the constitution, unless when the heart or its membranes have become implicated in the disease. Though the heart is very frequently affected in this disease, I have only seen one case in which the inflammation left the extremities and attacked the heart; in this case the disease as suddenly left the heart and fixed upon the membranes of the brain; the patient ultimately recovered, but no inflammation returned in the extremities. In one case of rheumatic fever which occurred in a delicate girl of fourteen, suppuration took place in several parts of the body and limbs; I think more than twenty abscesses required to be opened before she recovered. I have never considered chronic rheumatism as a frequent disease here, but I must observe that I have generally considered those pains which are commonly called rheumatic, as depending upon a disordered state of the digestive organs, and treated them as such.

Croup is not a very frequent complaint, and, in its acute form, is rarely fatal, unless it has been neglected in its early stage. I find that children will bear the loss of a greater quantity of blood, and will recover more rapidly from its effects, when it has been taken from the jugular vein, than by any other method. I have seen more children recover who took, after bleeding, oxymel of squill with tartar emetic, every hour, in sufficient doses to keep up nausea, than by any other plan of treatment.

Chronic Croup I have found a much more fatal complaint. Patients frequently go about for several days with but little inconvenience, have very little cough or fever, nearly lose their voice, and die from suffocation. In two instances I opened the trachea; the whole of its internal surface was lined with a tube of lymph.

Cancer.—In eight or ten cases of scirrhous mamma in which I have removed the diseased part, though all recovered perfectly from the operation, I believe that every individual died in less than three years afterwards, from a return of the disease in different parts of the body.

Twenty years since, when there was a great demand for houses, they were frequently inhabited before they were dry. At that time phlegmasia dolens was a very frequent disease; I have not now seen a case for many years. During the same period puerperal fever was very common, but a severe case is now rare. In the advanced stage of the last disease, when the abdomen continued enlarged, with a doughy feel upon pressure, I have seen great benefit from drachm doses of the spir. terebinth, given every

three hours, and its external application mixed with equal parts of linimentum ammoniæ.

Though large quantities of cider are drunk with impunity, in any state, by persons who have been accustomed to its use, I have known violent inflammation of the stomach, colon, and rectum, produced by its use, in persons who were not cider drinkers. Very new and very old cider are both apt to disagree, even in small quantities. I have known a quart of old cider produce inflammation of the stomach, which proved fatal, and two small glasses, daily, of new cider, occasion violent dysentery.

Diseases of the heart and large blood-vessels are very frequent, but I am not aware of any peculiarity connected with these complaints, which is not well known.

PART III.

Essays and Cases.

ADDITIONAL FACTS AND OBSERVATIONS

ON THE

EFFICACY OF STRYCHNIA

IN SOME FORMS OF PARALYSIS.

BY JAMES LOMAX BARDSLEY, M. D.

Physician to the Manchester Royal Infirmary, Dispensary, Fever Wards, &c. and Lecturer on the Principles and Practice of Physic and Materia Medica.

SINCE the publication of my "*Hospital Facts and Observations*" in 1830, a sufficient time has elapsed to enable the profession to judge of the real claims of Strychnia, and some other *vegetable alkalis*, to further trials as remedies in disease. This paper will be devoted to the consideration of the value of strychnia in some forms of paralysis, as established by my more extended experience with this alkali, and by the testimony of other practitioners. From inattention to the *observations* connected with the cases illustrative of the remedial powers of strychnia which were presented to the profession, some practitioners seem to have imagined that strychnia was proclaimed as an infallible cure for every form of paralysis, although proceeding from cerebral disorganization. Nothing can be more erroneous than such an impression, for I have distinctly stated that this remedy was employed in "*some* of the cases of

paralysis with *no benefit,* in others with only *partial advantage,* but in the majority with complete success;* and hence it was termed an efficacious, though not a *certain* remedy in this affection. The next sentence is as follows: "Whenever, (as our relative, Dr. Bardsley, sen. observes,) paralysis arises from tumours compressing the substance of the brain, or from a diseased alteration in its mass and structure, or from extravasation of a fluid in such a state or degree as will not admit of its absorption, it will be readily admitted that no benefit is to be expected from the employment of any remedy which has yet been discovered."

Dr. Elliotson seems to have taken a proper view of the probable advantage to be derived from strychnia, or any other stimulant, in paralytic affections depending upon compression of the brain, from serous effusion or sanguineous extravasation, or connected with some other organic change of the cerebral substance. He justly observes in one of his lectures on paralysis,† "that in common cases, arising, as they often do, from disease in the brain, as I shewed you a few days ago, and where the parts have become softened in consequence, you might give strychnia till the patient jumped out of bed, but it would only be to lie on the floor." He has, however, witnessed the beneficial influence of this alkali in several cases of paralysis arising from torpor of the nerves. The testimony of Dr. Graves, of Dublin, respecting the value of strychnia in paralysis, is highly important. In one of his clinical lectures he

* Hospital Facts and Observations, p. 38.

† Medical Gazette for March, 1833.

remarks, "the *local* application of strychnine has also been found beneficial in local paralysis, and I have observed very favourable results from the application to a vesicated surface. Some writers have recommended its employment in painters' colic, and, I must say, that it is an admirable medicine in all cases of paralysis which commence in the nervous extremities, whether it be amaurosis, creeping palsy, paralysis from lead or from cold. As far as my experience goes, strychnine, and, probably, sulphur also, are extremely useful when the disease originates in the peripheral extremities of the nerves, while, on the other hand, they appear to be of little advantage when the central parts are primarily engaged. However, as paralysis, arising in the centre, may continue to affect the extremities after the cause has been removed, this position is to be received with some exceptions." "Strychnine," he continues, "is applicable not only to those cases of paralysis which commence in the extremities, but also when it began in the centre; but after remaining for some time, and then yielding, the disease still lingers in the extremities."* My further experience with strychnia leads me to repeat, that it is in such cases of paralysis as seem to arise from diminished nervous excitement, that this remedy is particularly indicated; and, generally speaking, that it is likely to prove more serviceable in paraplegia, unconnected with spinal disease, than in hemiplegia, though I feel confident that it will not unfrequently be found an important remedial agent even in hemiplegic paralysis, when the cerebral mischief is not very ex-

* London Medical and Surgical Journal for March, 1833.

tensive, and the nerves are still capable of being acted upon by appropriate excitants. I can state, on the authority of facts occurring within the sphere of my own observation and that of others, that strychnia has proved curative in cases of palsy of long standing, after the complete failure of the discipline ordinarily adopted in these attacks. The late Dr. Somerville, of Stafford, communicated to me an interesting case of paralysis of the hands, arising from the absorption of lead, in which strychnia removed the disease in less than a month. The patient commenced with the eighth of a grain twice daily, but, at length, took one grain within the same interval. Dr. Bright, in his valuable Medical Reports, (part i. p. 338,) has alluded to the power of strychnia in exciting an action in the nerves of paralytic limbs. "In a case of local paralysis," he observes, "I have applied this powerful remedy in doses of the eighth, the quarter, or half a grain, to a blistered surface, with the effect of producing spasmodic action through the paralysed muscles, and I have, sometimes, administered it internally with advantage." "Cases of hemiplegia from the rupture of vessels," he continues, "are not those in which this remedy holds the greatest prospect of success, though, with caution, it may be employed in the advanced stages of convalescence with safety at least, and, sometimes, with benefit. The same intelligent author has also detailed a case of paralysis from lead, relieved by the external application of strychnia to the affected limb. The twentieth part of a grain of the alkali, dissolved in alcohol, was first applied to the blistered part over the extensor muscles of the fore-arm. This

proportion was gradually increased to one-third of a grain, which was applied, almost daily, from the 17th of November to the 15th of December, and with the effect of producing very marked spasms and a decidedly good result. In the Midland Medical and Surgical Reporter, a case is related of partial paralysis of the right side occurring in the person of a boy, ten years of age, who was admitted into the Worcester Infirmary, with whom the internal exhibition of strychnia was attended with much benefit. The dose was augmented from the sixth to the third of a grain, three times daily. The following is the report of the 7th of July: "Has continued to improve under the use of strychnine." Mr. Gaskoin has published a very striking instance illustrative of the efficacy of the sulphate of strychnia in paralysis, in the June number of the Medical Gazette for 1832. The patient, a boy, twelve years of age, was incapable of moving the head or any part of the vertebral column from the place of support. He could not stand, but he had the power of using both legs and arms, and of rotating the head from side to side. Local bleeding, perpetual blisters, caustic issues, mercurial frictions both on the spine and extremities, and mercury, given internally, during several months, had not the slightest remedial or constitutional effect. Mr. Gaskoin now proposed the trial of the sulphate of strychnia, and the patient commenced, on the 1st of November, with one-thirtieth of a grain three times a day, and the dose was gradually increased one-thirtieth at a time, until, on the 16th of November, he took six-thirtieths three times a day. "On the 19th, he experienced slight dizzi-

ness, with great pallor and loss of consciousness for about half a minute, but no twitchings of the muscles." The dose was, in consequence, reduced to four-thirtieths of a grain, and it was again gradually increased to one-fifth on the 24th, and no recurrence of any unpleasant symptom taking place, it was continued, without intermission, three times a day until the 12th of December. "On the 4th of December, he felt a sensation of power in his neck, and was, in the course of the day, able to elevate it from its support, and move it backwards and forwards. It will be remembered, he could before partially rotate the head when supported. No further improvement was noticed until the 11th of December. At four o'clock on that day, the very frequently repeated trial was made, but, on pulling him forward, the back, as usual, dropped. About seven o'clock, he said to his mother, "I don't know, but I feel as though I could stand." He made the attempt with assistance, and tremulously did so for a few seconds, and in the course of the evening, by merely placing his hands on the table, &c. He was carried, as usual, to bed by his servant, and we may better and more easily imagine than describe the feelings of his mother, on perceiving him reflected in her glass, whilst at her dressing table, advancing on limbs which had not borne him for so many years, upright, firmly, and alone, into her room the following morning." "During the employment of this active and powerful remedy," Mr. Gaskoin observes, "the patient experienced no sort of disturbance other than that described to have occurred on the 19th November, and every hope being fulfilled, the dose was

decreased to a tenth of a grain three times a day, on the 13th December, and discontinued entirely on the 16th. He continues in excellent health." I entirely coincide in opinion with Mr. Gaskoin, that the most useful mode of administering the strychnia is that of exceedingly gradual increase, and its continuance at that dose which produces a certain constitutional action.

In the spring of last year, I received the following case from a gentleman of high respectability, in Essex, with a request that it might be laid before the public if agreeable to my views. I shall, therefore, present it in the words of the narrator, who was a near relation of the patient's. Miss S. C. S. was born in April, 1804. She enjoyed tolerably good health until the year 1818. In the winter of 1818, 1819, she had an inflammatory attack in the foot, owing to which she was confined to the house nearly three months. In 1820, the tenderness of the foot returned, but continued only a short time. From 1822 to 1826, she was in the habit of taking strong exercise, particularly on horseback and in gardening, but was never able to walk more than three or four miles without experiencing considerable fatigue, and a sensation of weakness and pain in the back. In the autumn of 1826, she had a severe and long attack of remittent fever, which left her in a state of great general debility. The functions of the stomach and bowels were very imperfectly performed, and the weakness and pain in the lower part of the back became more fixed and severe. This dorsal debility increased so rapidly, that, by the end of May, she was unable to walk, and was always carried from the

bed to the sofa. Her general health suffered considerably. In July, 1827, she was moved (fifteen miles,) to the sea side for change of air, and, although placed on a bed in an easy carriage, she was so fatigued by the journey, that she remained for some time in a very alarming state of exhaustion. She resided nearly six months by the sea side, and with improvement to her general health, but the pain in the back continued severe, and the legs remained almost powerless. There was no great change in her state from this time until June, 1828, when she was attacked with a bilious fever, which again produced great debility. In the summer of 1829, the pain in the back became more intense, much tenderness and heat were felt over the centre of the sacrum, the loss of power in the lower extremities increased, and, in addition, a painful sensation of dragging in the joints, particularly in the knees and ancles, and, afterwards, in the hips, began to be experienced. This sensation continued to increase in intensity and duration, till the summer of 1830. In August, 1829, she was conveyed fourteen miles, for the purpose of consulting Sir Charles M. Clarke. In the spring of 1830, the pain extended higher up in the back, and, also, downwards, towards the hips; and the loss of power affected the hands and arms, and the dragging sensation was very painfully felt in the elbows and wrists, and, sometimes, even in the shoulders, as well as in the lower extremities. Her general health continued to decline. During almost the whole of the period from 1826, to July, 1830, the digestive functions were very imperfectly performed, and there was, occasionally, profuse leucorrhœa. The plan

of treatment suggested by Sir Astley Cooper, who visited the patient in February, 1828, and by Sir C. M. Clarke, who saw her in August, 1829, as well as by her medical advisers in the country, had a long and fair trial; the greatest attention was paid to the state of the general health, leeches and cupping were applied to the back, and counter-irritation, by means of setons, tartar emetic ointment, tartar emetic plaisters, and continued blistering, were submitted to with undeviating readiness and patience, but without any *permanent benefit*. The following account of her condition, on the 16th July, 1830, was drawn up by her regular medical attendant. "She has now been ill nearly four years; she has entirely lost the use of her lower extremities, but their sensibility is natural, or rather more acute than usual; there is considerable pain across the loins, extending from one spine of the ilium to the other, and over the whole surface of the sacrum; there is, also, a diffused tenderness of the integuments of the same parts, and, also, at times, much turgescence and a feeling of fullness; there is considerable weakness of the upper extremities; she sleeps but indifferently, in general, in consequence of pain in the joints, particularly the ancles and wrists, which she describes to be a sensation as if the joints were separating by violent extension. The periodical evacuations are regular, and tolerably natural; there is, in the intervals, occasionally, some leucorrhœal discharge, which is not continued, but appears in considerable quantity suddenly, and then ceases; it is thin and transparent. The appetite is bad, and almost every article of diet disagrees with the stomach, inducing

a sensation of fullness and oppression; the bowels are very irregular, and the evacuations, generally, very slimy and unnatural in their appearance. She is subject to rather frequent attacks of increase of all the dyspeptic symptoms, attended with head-ache and foul tongue, at which time there is an aggravation of all her painful symptoms. She is just recovered from one of these attacks, and the tongue is now clean and almost natural in appearance; the pulse is 81, weak, and easily accelerated."

"The work of Dr. James L. Bardsley (Hospital Facts and Observations,) having been met with by the medical advisers of Miss S. C. S. they were induced to make a fair but cautious trial of the *strychnine*. The following is a faithful report of the administration of this medicine to Miss S. and of the effects which, in her case, have happily resulted from the use of it."

"Saturday, 17th July, 1830.—Miss S. commenced with the twelfth of a grain of strychnine once daily. 20th. The same proportion twice in the day. 24th. Two pills of one-eigth of a grain twice daily. 27th. One-eighth of a grain three times daily. 30th. One-sixth of a grain twice in the day. 31st. Ditto. August 1st. One-sixth of a grain thrice daily. 2nd. One-sixth of a grain three times daily. No effect was experienced until this day, except an improvement in the digestion and appetite. Two hours after the evening dose, she had a sensation of tension in the muscles of the face, and, also, in those of the lower part of the back, and extending down the legs. When the knees were bent, she could not straighten them without assistance. 3rd. One-sixth of a grain

three times daily. The tension was again experienced about three hours after taking the pill, and lasted for about an hour and an half. 4th. Ditto. 5th. Ditto. Tension less in degree. 6th. No tension or other effect experienced to-day. 9th. Increase of strength. This day she took part of a beef-steak, and felt no inconvenience from it. This she has not done before for more than two years. 10th. One-fourth of a grain three times daily. 13th. One-third of a grain three times in the day. The tension returned in a greater degree than before, and was quickly succeeded by slight convulsions in the lower limbs. Whilst under the specific influence of the medicine, she was unable to speak or move without bringing on violent twitchings both of the upper and lower extremities. The legs were forcibly extended, and the feet separated from each other, and on being placed in contact, they were involuntarily and irresistibly separated again; the sensations of the patient were not unpleasant, except when the spasms were excited. She felt an agreeable warmth extending from the head down the spine into the lower extremities; the breathing was natural; the pulse 91. These symptoms continued two hours, and then gradually subsided. After they had ceased, the pain in the lower part of the back was less than it had been for many months, and she felt, altogether, stronger. Sunday, 15th. One-third of a grain twice a day, at 10, A. M. and 10, P. M. This morning she feels quite comfortable, and not at all exhausted from the effects of the medicine. 16th. One-third of a grain twice a day, at 10, A. M. and 10, P. M. Renewal of the same symptoms commences about two hours after

each pill, but they are less in degree and in duration. 19th. One-third of a grain at 10, P. M. From 10 to 2 in the night of 19th and 20th, had more violent convulsive twitchings than on any preceding occasion. 20th. One-third of a grain at 10, A. M. Convulsive twitchings from $12\frac{1}{2}$ to 2, P. M. with agreeable warmth along the spine and in the stomach. 21st. One-third of a grain at 4, A. M. one-third of a grain at 4, P. M. 22nd. One-third of a grain at 4, A. M. one-third of a grain at 4, P. M. Similar effects, gradually diminishing in degree. 23rd. As yesterday; very mild twitchings. She can *stand* with the aid of her crutches, without trembling, and feels, altogether, stronger. 25th. No effect in the morning; in the evening some twitchings, mild and quick. The pain of the back now frequently ceases altogether for some hours. No effect on 26th or 27th, or morning of 28th. In the evening of 28th, she experienced a sense of faintness and giddiness, after which, the face was much convulsed, the legs were stiffened, and the head felt very light. 30th. No strychnine taken this day, nor until the evening of the 6th of September, when one-sixth of a grain was taken at 6, P. M. From the 27th of August to the 3rd of September, the patient was troubled with a return of the pains in the back, and in the wrists and ancles. She felt less well during the time she omitted the strychnine. Monday, Sept. 6th. One-sixth of a grain three times a day. The pains in the wrists, ancles, and back, entirely subsided after the second dose of alkali. 7th. One-sixth of a grain twice, and one-fourth of a grain once. 8th. One-fourth of a grain twice a day. 10th, 11th, 12th and 13th. One-fourth

of a grain, and one-thirty-second, twice daily. From the 5th to the 12th, no twitchings were experienced. She has improved much in general strength, and somewhat in power during this period, and the pain in the back has ceased altogether. 14th. One-third of a grain twice a day ; mildly excited ; great heat in back. 18th. Twitched in her sleep, also, after each dose of alkali. 20th. Same proportion continued. She now walks a few steps daily, with the aid of two crutches. 24th. Walks some steps with one crutch. One-third of a grain once daily. Walks with one stick, and is quite sanguine as to her ultimate recovery. October 3rd. She stands alone, and without even the aid of a stick. 5th. One-third of a grain twice daily. Walks five or six yards leaning on her brother's arm only. 7th. The glowing heat along the spine continues to be produced by every dose, and, generally, the twitchings, in a greater or less degree. 9th. Walks to her dressing-room, fifteen yards. 11th. One-third of a grain once a day. 24th. During the last fourteen days, the patient has continued to gain ground constantly, though somewhat less rapidly than during the preceding fourteen days. This day she walks through her three rooms, (30 yards,) leaning slightly on a friend's arm. She has had no pain in the back nor dragging pain in the limbs for seven weeks. 27th. The excitement from one dose scarcely subsides before the next dose is taken. 28th. One-third of a grain twice. With a few unimportant omissions, one-third of a grain has now been taken twice a day for six weeks. The patient's power increases daily ; this morning, whilst standing by the fire, she stooped down, lifted the poker and

stirred the fire. The convulsive twitchings have never wholly ceased to be produced, though irregular as to strength and duration ; this evening they were exceedingly violent, more so than they have ever been ; they lasted from 5 to $9\frac{1}{2}$ P. M. She could not bear the least noise, and the slightest motion brought on the spasms ; it was necessary to hold the legs to keep them at all quiet. At times she had much pain in the muscles at the back of the head and neck ; some tendency to spasm was also felt in the stomach ; brandy was administered, and appeared to moderate the spasmodic action of the muscles. She remained in bed, suffering much general lassitude. November 3rd. One-sixth of a grain of strychnine once daily ; even this excites her slightly. She walks down and up stairs. 6th. Highly excited ; the excitement continues all day, in consequence of which it was thought right to discontinue the strychnine altogether for some time, and it has not been since resumed up to the present time, May, 1831, but the exciting effects of it were, occasionally, felt for many days, or even weeks, after it was discontinued. The patient's improvement in strength, and in the power of using the limbs, continued gradually, but constantly, progressive. Some indications of this improvement, will appear in the following extracts from her journal. 26th. Walked to her cousin's, 250 yards. 28th. Dined with the family, sitting in a common arm chair ; now often walks about the house with her stick. Goes on improving, and her year's journal concludes with "what a blessing it is to end the year with restored health." Jan. 1, 1831. Walks to her uncle's, 550 yards. March 9th. Walks

to church, attends prayers, &c. 14th. Walks 600 yards, and calls on a friend. 27th. Goes to a musical party in the evening, and remains there two hours and a half. She is now (May) capable of walking slowly for an hour together without much fatigue; her rate of walking is, perhaps, a mile in an hour, but standing still for five minutes will bring on heat and pain in the back, (in the seat of the old pain,) which lasts perhaps a quarter of an hour after a sitting posture is resumed; the dragging sensation in the joints, knees, ancles, elbows and wrists, has not returned; her appetite and digestion are as good as ever they were."

I consider the above case to possess much interest, as affording striking evidence of the great advantage derived from a judicious and most persevering use of strychnia, in a well-marked instance of paralysis, after the failure of the ordinary remedies employed in that disease; and as pointing out the effects of the alkali upon the system with remarkable correctness and precision.

Dr. Anthony Todd Thomson has given the results of his trials with strychnia in paralysis, which tend to confirm the remedial value of that alkali. He has also endeavoured to shew, by experiments on dogs, that strychnia does not influence the circulation through the brain, even when it is given in quantities sufficient to produce death; hence he thinks that there is not much reason to fear the administration of this powerful agent, "in cases in which the paralysis may have arisen from pressure on the brain," but that on the contrary, benefit may be expected from such a stimulant of the nervous energy as strych-

nia.* Dr. Thomson has been in the habit of employing the strychnia in the form of an acetate. He dissolved two grains of strychnia in half an ounce of acetic acid, and then commenced with twenty minims of this solution for a dose, twice a day, gradually increasing the quantity according to the influence of the medicine upon the system.

I have much gratification in publishing the following case, which has been kindly communicated to me by a very intelligent physician, Dr. Booth, of Birmingham, as it tends to determine the limitations within which strychnia may be safely employed as a remedy, and also shows that the powerful action of this alkali is not exerted solely on the spinal marrow and its nerves, but that the brain participates in its influence, and that, therefore, a state of cerebral disorganization or congestion is unfavourable to the employment of strychnia in those forms of palsy which are connected with morbid conditions of that organ. "Wm. Jones, æt. 46, of irregular habits, (as I am induced to believe,) was admitted a patient of the Birmingham General Hospital, under my care, on the 25th March, 1831, with hemiplegia of the left half of the body, the power of motion being completely lost, and sensation much diminished; but his memory and speech were not materially impaired, so that he was able to state that three weeks previously to his admission, after having been excited by drinking in a hot room, and suddenly exposing himself to a draught of cold air, he was seized with giddiness and fell down, having lost all power over his limbs; this state was followed by severe pain in the

* Medical Gazette. April, 1831.

head, which continued three days, when it subsided, and he discovered that the left side of his body had become completely powerless. During a second period of three days, there was no amelioration of this symptom, but rather on the contrary, an increase; and on the 7th or 8th day from his first seizure, he lost command over the bladder and rectum, so that his urine and fœces were passed involuntarily. Such was his state at, and until his admission, twenty-one days from the commencement of his illness. On the first day of his coming into the hospital, he was bled and purged rather actively, without producing, however, any apparent effect on his palsy. On the fifth day after admission, he commenced taking half a grain of strychnia, in the form of pill, twice during the twenty-four hours, which dose he continued for five days, without its producing any sensible effects. On the tenth day, the dose was increased to one grain of strychnia twice a day, and, after the third dose, the specific action of this medicine was first manifested by pain in the head, back, and lower limbs, followed by involuntary contractions and startings in the muscles of the spine and inferior extremities. The contractions ceased and returned at uncertain intervals during the night, but they subsided before morning. On the 13th day, the report states, that the same symptoms had recurred daily since the last date, about an hour after taking the dose of the strychnia, but in a diminished degree; and that this had also been the case after taking this morning's dose. On the 14th day, the effect of the medicine was much less marked, and it seemed gradually to have lost its

activity. On the 15th day, no sensible effects were produced by the pills, both according to the testimony of the patient himself, and of the observers in the ward. He was therefore directed to take an increased dose, viz. one grain and a half every morning only, and to be strictly watched. On the 16th day, after taking this morning, for the first time, the increased dose of strychnia, the patient seemed to be greatly excited, his countenance and gestures manifesting an unusual eagerness and solicitude. In the course of three hours, a degree of stupor came on, with loss of speech, followed by tetanic convulsive movements throughout the whole muscular system, the spinal muscles being ESPECIALLY affected, so as to produce a state of opisthotonos, which, but for the prevention of the assistants, would have thrown the patient out of his bed. In the midst of this convulsive state, consciousness seemed to remain, as he still pointed to his *head,* when questioned as to the *seat* of his pain, although he had lost the power of speech. His pulse, at this time, was irregular and uncertain ; his breathing short, laborious, and, occasionally, stertorous ; his pupils dilated, and insensible to light. After the period of twenty minutes, there was an intermission of these symptoms ; the convulsions gradually diminishing, until, for a minute or two, they might be said to have ceased. In this interval, the patient's speech returned, and he answered questions rationally, although in a hurried manner ; complaining of violent pain in the head ; but the tetanic paroxysm recurred again and again, with intermissions of a minute or less, until, at the end of ten minutes, he sank into a state of insensibility, and

the spasms returned with increased violence, his breathing became stertorous, or it was accomplished by gasps; his body was rigidly and permanently bent backwards; the pulse became imperceptible, cold sweats covered the surface, and death immediately followed. The immediate cause of his death was the spasm of the respiratory muscles, by which a state of asphyxia or suffocation was produced. He expired in three hours and three quarters after having taken the increased dose (one grain and a half) of strychnia.

Post mortem examination, seven hours after death. April 16, 1831.—*External appearances.*—The fingers were firmly contracted, and the muscular system, generally, was in a state of spastic rigidity.

Brain.—A considerable quantity of liquid blood flowed from the division of the scalp; the vessels of the dura mater were also turgid with dark-coloured blood. The arachnoid membrane was opaque and thickened, throughout all its inflections, but particularly at the base of the brain. The basilar artery, and the arterial circle of Willis, were somewhat diseased, and spotted with atheromatous deposition. In the right *corpus striatum,* there was an apoplectic clot, dark-coloured and grumous, of an irregular figure, and, in bulk, about the size of a very large walnut. The substance of the brain in contact, and in the vicinity of this clot, which was clearly of previous formation, was in a state of *ramolissement* in several parts. The lateral ventricles contained about f.℥iss. of yellowish serous effusion. The other parts of the brain were healthy.

The spine.—The investing membranes were found in a highly vascular and injected state; the pia mater was of a florid redness, and every where congested with arterial blood; there were four recently extravasated patches of blood between this membrane and the arachnoid, which was also thickened and opaque, as in the brain. These patches were situated opposite the last dorsal, and the two first lumbar vertebræ; and, in the lowermost, a distinct coagulum could be recognised. The spinal marrow itself was healthy. It is also to be regretted that the thorax and abdomen were not examined, owing to the interference of the friends of the deceased."

"I consider this case and its sequelæ," says Dr. Booth, "as sufficiently demonstrative of the fearfully energetic influence of strychnia on the brain, as well as on the spinal marrow, and, therefore, as enforcing restrictions which would almost interdict its use in an injured state of the brain, or, at all events, stop it far short of that test of its efficacy which, *as my own experience can confirm,* in cases of paralysis arising from *diminished nervous* excitement, may safely be adopted. That test is the *convulsive twitchings of the paralytic members,* as stated at page 40 of Dr. Bardsley's excellent work." "It is in such cases of paralysis as seem to arise from diminished nervous excitement, that the strychnia is particularly indicated." p. 38.

It has never occurred to myself to witness a fatal result from the use of strychnia, nor do I consider the dose employed in the preceding case to have been sufficiently large to occasion death, independently of a strong disposition to an apoplectic seizure on

the part of the patient. Neither can I admit with Dr. Booth, that the death, in this case, was wholly attributable to the dose of strychnia employed, for the report of the dissection proves the existence of previous organic disease in the brain, viz. opacity and thickening of the arachnoid membrane "throughout all its inflections, and particularly at the base of the brain," together with a diseased condition of the basilar artery and the arterial circle of Willis, and the presence of an apoplectic cell in the right corpus striatum. It is not difficult to suppose that, with such a morbid state of the brain, a trifling degree of excitement might prove fatal. I can offer Dr. Booth the most respectable testimonies to shew, that the same quantity of the alkali has been exhibited in several instances, not only without unpleasant effects, but with marked advantage; and I consider his administration of the remedy to have been both cautious and judicious. My experience, however, with strychnia, leads me to unite with Dr. Booth in enforcing the necessity of care in the use of this alkali, in those instances of paralysis in which the brain has been severely affected. Dr. Booth considers that Dr. A. T. Thomson has fallen into an error, by suggesting a relaxation of that caution which had restrained practitioners in the employment of strychnia, in those cases where there were head-ache and vertigo from determination of blood to the head. He also thinks that Dr. Thomson's two experiments, in relation to the therapeutic corollary deduced from them are insufficient; for, in both of them, he observes, there was a collision of effect from the different agents employed either at

the moment or previously. Moreover, the rapidity of death, after taking the poison, would almost preclude the possibility of inflammatory action, whatever tendency there might be thereto.

From the following interesting experiments on dogs, instituted by Dr. Booth, wherein the slower process of the poison might afford time for its operation on the brain, viscera, and tissues, it will appear that he has formed conclusions opposed to those of Dr. Thomson, both anatomically and practically.

Experiment I.—Tuesday, April 26th, 1831.—On a shepherd's dog, about one year old, weight 24 lbs. At 4, P. M. one-sixth part of a grain of strychnia, inserted into a small piece of meat, was thrust down his throat. The animal was closely watched until 7, P. M. but no effect from the pill was observable. 27th, 3, P. M. another pill, containing one-fourth of a grain of strychnia, was given. The dog was watched as before, but no effect was noticed. The dose (gr. $\frac{1}{4}$) was repeated on the 29th and 30th, but equally without any apparent effect having been produced by it. May 1st, 4, P. M. a pill, containing half a grain of strychnia, was administered; at a quarter before five, no effect was observable; at five he was found lying on his side, with his legs extended, mouth open, and his whole body in convulsions. His mouth would frequently close with a loud snap; the pupils of the eyes were alternately dilated and contracted. Respiration was carried on with difficulty, and the action of the heart was very irregular; sometimes contracting ten or twelve times in rapid succession, then suffering an intermission of three or four seconds, The animal continued

in this state till ten minutes past five o'clock, when, the convulsive action of the muscles gradually subsiding, he died.

Sectio cadaveris, 4, P. M.; May 2, twenty-three hours after death.—The calvarium, and the exterior portion of the vertebral column, having been removed, so as to expose, at one view, the brain and medulla spinalis, the following were the appearances noticed.

Brain.—The blood-vessels injected and beautifully arborescent. The pia mater covering the medulla oblongata particularly vascular or injected. The choroid plexus very vascular. No serum in the ventricles. In cutting into the substance of the brain, several dotted points were observed.

Medulla Spinalis.—In the bony cavity of the spine there was much congestion about the sinuses, and great vascularity of the membranes about the upper dorsal and the lower lumbar vertebræ. The dura mater of a light pink colour and turgid. The arachnoid membrane natural. The internal structure of the chord itself was dotted with sanguineous points.

Thorax.—In the cavity was contained from about ʒss. to ʒi. of fluid. The lungs were collapsed and congested, but did not sink in water. The heart was turgid, and on both sides filled with black blood.

Abdomen; Stomach.—The mucous coat had a slight pink blush.

Intestines.—In the *Ileum* were found several patches, varying, in magnitude, from the size of a six-pence to that of a shilling; also, an oblong patch of four or five inches in length, and a finger's breadth, apparently the seat of ulceration in the mucous coat

of the intestine. It had a reticulated appearance. The aggregate and solitary glands were seemingly the parts affected. In the *Colon* the same appearances were more sparingly found. In the cœcum and rectum numerous prominent pustules or pimples, with a point of depression in the centre of each, and containing a viscid fluid, were very conspicuous, giving, altogether, an appearance not dissimilar to that of small-pox pustules in the early eruptive stage."

"*Experiment II.*—May 1, 1831. On an old terrier dog. At 4, P. M. a pill, containing a quarter of a grain of strychnia, was thrust down his throat, enveloped in a small ball of fat. The animal was carefully watched for four hours afterwards, but no appearances indicative of any influence from the strychnia presented themselves. May 2, at 4, P. M. another pill, containing the same quantity of strychnia (gr. $\frac{1}{4}$,) was given. The dog was watched for four hours afterwards, but no symptoms of inconvenience were observed. May 3, at 4, P. M. the animal swallowed the same dose, in the same manner as before, and was similarly watched, but no observable effects were produced by it. May 4, at 4, P. M. another pill, containing a quarter of a grain of strychnia, was administered. The animal was watched till seven o'clock, (three hours after having taken the pill,) but no symptoms of its having taken effect were observed. May 5th, 10, A. M. On visiting the dog with the intention of giving him food, he was found lying on his side, quite dead and cold; his limbs stiff and extended. A quantity of frothy mucus adhered to his mouth. His jaws were so firmly closed, that considerable difficulty was expe-

rienced in forcing open his mouth; the muscles, generally, were in a spastic state.

Sectio cadaveris, 4, P. M.—External appearance. The limbs were in a state of spastic rigidity. The *Brain*, although rather gorged with blood, was not equally so with the preceding subject. The choroid plexus congested and dark coloured. No effusion in the ventricles. Of the pia mater, some of the inflections following the convolutions of the brain were very vascular. An hydatid was found in the inferior horn of the right lateral ventricle.

Spine.—On opening the osseous canal of the spine, no effusion appeared to have taken place between the membranes of the spinal marrow. The surface, however, of the pia mater, about the cervical and upper dorsal vertebræ, was vascular. The structure of the cord itself was healthy, excepting that the lumbar portion was rather softer than the upper.

The *Thorax*.—The lungs, on both sides of the thorax, were collapsed, dark coloured, and gorged with blood, and barely buoyant in water. The trachea, internally, was of a bright pink colour, and coated throughout its ramifications with a frothy mucus. The pericardium exhibited an inflammatory blush, together with recent depositions of lymph both on the reflected and proper surfaces of the membrane. The heart contained no coagula in its cavities, neither did the large veins or arteries. The heart was distended with dark blood; the blood had an unctuous appearance.

Abdomen.—*Stomach*; its villous coat along the greater curvature was softened, and of a brownish colour.

Intestines.—In the duodenum, softening of the mucous coat, with two or three ulcerated patches, was observed. In the ileum, particularly at its junction with the cœcum, ulcerations, having pits or foveæ, like the depressions on the rind of a rough or coarse orange, were conspicuous. The colon throughout was studded with small prominent elevations, each having a depression at the apex, and not unlike the immatured pustules of small-pox. This eruptive appearance was more particularly observable about the appendix vermiformis and rectum. The aggregate and solitary mucous glands of the intestines were undoubtedly the seats of this appearance."

"As a candid enquirer after truth," says Dr. Booth, "the preceding facts and observations have irresistibly impressed my mind with a conviction of the fallacy of the hypothetical doctrines, according to which an entire class of vegetable poisons (the bitter strychnos) is said to possess the singular property of expending, through the medium of the circulation, their influence on the spinal marrow, without directly involving the functions of the brain, or uncombined with any injury of that organ. Paris's Pharm. (Ed. vi.) vol. i. p. 24. Christison on Poisons, (Ed. ii.) page 754. The action of strychnia on the spine is represented as even quite *independent* of any action on the brain, "*if, indeed, such action exist at all.*" (Christison on Poisons, 2nd ed. p. 19.) To the same effect Orfila has recorded the result of an experiment, (on Poisons, vol. 2, p. 270, 2nd ed.) but I may venture to observe, that the very irritation itself, consequent on dividing the spinal marrow of

animals, will keep up spasmodic action; and that, with respect to indications of the state of the brain during such experiments, we do not possess adequate criteria by which we can, in animals, satisfactorily determine the fact. In man, however, we have indisputable means of assuring ourselves of the participation of the brain in the energetic influence exerted by strychnia on the spinal marrow and its nerves." "The representations made by the patients themselves, almost uniformly, of their suffering pain in the head, and vertigo, *previously* to the invasion of the spinal convulsions, and during those convulsions; the palpable indications afforded of the nerves supplied by the brain, being affected in the nictitation or twitching of the eye-lids, and agitation of the muscles of the countenance, from clonic spasm, collectively demonstrate the influence of the alkali on the brain itself. This very day I had occasion to observe the existence of the cerebral influence of strychnia, in a patient affected with hysteric-paraplegia, for fifteen minutes *before* any indications of the specific spinal effects of the alkali supervened. The patient is, at present, taking forty-two drops of the tincture of strychnia every six hours. She has been under a course of the medicine during seven weeks, beginning, originally, with thirty drops, and I am happy to say that she has derived the *most striking advantage* from its cautious and persevering use, far surpassing, in a very obstinate and perplexing case, *the effect of every other varied method of treatment.*" The more immediate object in my view, when citing this case, is the perfect illustration it affords of the absolute influence of strychnia

on the brain, as well as on the spinal marrow, for the former has uniformly preceded, and has, sometimes, even not been succeeded by the specific manifestations of the latter species of influence.

Dr. Roots has related the case of Phœbe Munson, who suffered from paralysis produced by cold. She had nearly lost the entire power of her arms, and could only walk with the assistance of a person on each side of her, dragging her legs along the floor; and she complained of a constant sensation of general coldness and weakness. He applied a blister to the nape of the neck, and ordered her the sixth of a grain of strychnia three times a day. The dose of strychnia was gradually increased or diminished, according to the degree of its effect. At one period, about the tenth day after she commenced with it, she took half a grain three times a day, but she was unable to persevere with this proportion of the alkali, owing to its influence upon the brain. "On the fourth day," says Dr. Roots, "from the commencement of her taking the strychnia, the sensibility and motive power had considerably increased; in less than a fortnight sensation was perfectly restored, and by the expiration of the month, she was able to walk firmly and without any support, taking each leg fairly off the ground. Ultimately, before she quitted the hospital, she was able to walk, to use her own words, as well as ever she did in her life."* In this instance the head was, on several occasions, much affected during the exhibition of the strychnia. Dr. Roots' experience with respect to the action of the alkali, not being confined *solely* to the spinal cord,

* London Medical and Surgical Journal, for March 9, 1833.

coincides with that of Dr. Booth, as stated above. He has known many patients, whilst taking strychnia, to complain of pain in the head, vertigo, and dimness of sight, and sometimes, even, to such an extent, that they have fallen down in a state of insensibility. Dr. Balfour, in his able inaugural dissertation, "De Strychnia," printed in 1831, has very clearly detailed six cases of paralysis occurring at the Edinburgh Royal Infirmary, under the care of my late amiable and distinguished friend, Dr. Duncan, in which the good effects of strychnia were most decisive. I shall only select the following example.

A young girl, aged 15, was admitted into the Edinburgh Infirmary on the 9th of April, 1830, labouring under complete paraplegia. Abstraction of blood, blisters, friction with the tartar emetic ointment, and purgatives, were fairly but ineffectually employed. On the 16th of May, the legs were directed to be rubbed with the tincture of cantharides, and one-sixth of a grain of strychnia was exhibited three times a day. The dose was gradually increased to two grains within the twenty-four hours. She soon became capable of moving the toes, but the loss of power in the legs and thighs continued. Owing to some unpleasant effects from the strychnia, it was omitted during two days, when she recommenced with half a grain twice a day. The dose was carefully augmented, until she took a grain of the alkali four times in the day, but in this proportion the alkali occasioned rather violent symptoms, which required for their removal the liberal exhibition of stimulants. Almost immediately after this powerful action of the strychnia upon the system,

she began to use her limbs, and in three days was able to walk. She rapidly improved, and was discharged, cured, in June. This patient took, in the whole, forty grains of strychnia, and the largest quantity was one grain four times a day.

In a letter from Dr Duncan in 1830, he says, "that he has found strychnia infinitely more useful than any other remedy hitherto proposed in cases of paralysis arising from cold or from lead."

I was consulted, about a year and a half ago, by a medical gentleman in the country, who was suddenly seized with hemiplegia of the left side, without the occurrence of any premonitory symptoms. He had scarcely any control over the sphincter muscles, the articulation was affected, strength reduced, appetite impaired, and vision indistinct. Copious bleedings, blistering, cold sea bathing, purgatives, and a course of mercurial friction had been adopted, but without any good effect. I advised the trial of strychnia, and he accordingly commenced with the sixth of a grain of the alkali twice in the day. The dose was gradually increased to one-half of a grain three times a day. This quantity induced, at first, giddiness, with vomiting and spasm of the abdominal muscles; but he afterwards took half a grain four times daily, without experiencing any further disagreeable symptoms from the remedy. This gentleman steadily persevered in the use of strychnia for more than three months, during which time the healthy limbs were only once affected by the medicine, whilst the muscles of the paralysed members were mostly seized with sharp convulsive twitchings in a short time after each dose of the alkali. His

amendment was gradual, and in his last letter to me, he says, "my left side is almost as strong as my right, and I can perform my professional duties with comfort to myself, and, I trust, satisfaction to my patients."

I was requested, some time ago, by an intelligent friend and former pupil, to give my opinion as to the propriety of employing strychnia in the case of a patient under his care suffering from paraplegia, in which he had unsuccessfully resorted to local abstraction of blood, blistering, issues, warm sea-bathing, galvanism, and electricity. I directed him to give, at first, one-sixth of a grain twice daily, and gradually to increase the dose until the influence of the alkali upon the system became evident. The proportion of half a grain, taken three times daily, produced strong twitchings in the lower limbs, and a peculiar tingling sensation in the upper part of the thighs. He continued this dose for more than four months, and with the happiest result, for when I last saw the patient, both sensation and the power of voluntary motion in the inferior extremities, had completely returned. His general health was excellent. A man, named Brown, was admitted into the fever wards, from my district, on the 2nd of August, 1831. He had the usual symptoms of synochus, which soon yielded to the ordinary remedies, and he was reported convalescent on the 20th of the same month. In the course of three weeks after leaving the institution, he presented himself as an out-patient of the infirmary, and said that since the attack of fever, he had never been able to use the lower limbs as formerly. On examination, I found

him affected with partial paralysis of the inferior extremities, unattended with pain in the spine, or loss of power in the sphincter muscles of the bladder and rectum. His general health was good, and the habits of his life accorded with strict temperance. I prescribed the sixth of a grain of strychnia night and morning, and this dose of the alkali was continued for a week, when it was increased to the fourth of a grain three times daily. No effect having ensued from this dose, he was directed to take half a grain twice in the day. In a short time, he experienced convulsive twitchings in the affected limbs after each dose of strychnia. I now ordered half a grain to be given three times daily, and the patient steadily adhered to this proportion for more than a fortnight, and with almost daily increase of power in the extremities. At the end of five weeks from his first employing the strychnia, Brown had entirely recovered the use of his lower limbs, and was, accordingly, discharged cured. His appetite was excellent, and he improved in flesh. He declared himself stronger and better than he had been for several years, and I have the satisfaction of knowing that he continues perfectly well.

Dr. Geddings, of Charleston, S. C. has recently published some interesting and valuable observations and reflections on the employment of strychnia in the treatment of paralysis, in the American Journal of Medical Sciences, of which an abstract has been published in the August number of the London Medical and Physical Journal. He has detailed several cases, which most satisfactorily and unequivocally establish the powerful and beneficial effects

of the alkali. It may be proper to shew, that much advantage has been derived from the *external application,* as well as the internal administration, of strychnia, in several marked examples of paraplegia and local paralysis. In the eleventh volume of the Glasgow Medical Journal, Dr. Auchinloss has related the following case of partial palsy, cured by the local application of strychnia. A man, 56 years of age, of intemperate habits, was admitted into the Glasgow infirmary with an ulcer on the right leg. Ten days previously he had suddenly lost the power of the left fore-arm and hand; the sensation of the parts, however, remained perfect. A blister was applied to the back of the fore-arm, and one-eighth of a grain of strychnia was directed to be sprinkled over the vesicated surface. On each successive day the application was increased, by adding the original quantity to that of the preceding day, till it amounted to one grain, after which, one-fourth, instead of one-eighth, was to be added. From the second week, he perceived that the parts began to improve in power daily, and he experienced an occasional prickling sensation along the fore-arm and fingers. No obvious constitutional effect ensued. He was dismissed, cured, in five weeks from the commencement of this mode of treatment. In another instance of paralysis of the flexor muscles, with diminished sensation in the right leg, from the knee downwards, a similar practice was adopted, and with the same good effect. The patient was dismissed, cured, in six weeks.

My friend and colleague, Mr. Wilson, surgeon to the Royal Infirmary, made trial of the topical appli-

cation of strychnia in two severe cases of paraplegia, proceeding from spinal injury, with evident benefit. One patient was a collier, who, owing to the accidental breaking of the rope attached to the basket, in his ascent from the pit, was precipitated from a considerable height to the bottom. He was immediately brought to the hospital, when it was found that he had entirely lost the power of moving his lower extremities, and that the bladder and rectum were paralysed. He also complained of much pain in the sacrum. The pain was removed by cupping and blistering, but the paralytic symptoms remained unchanged, notwithstanding the use of various remedies. Mr. Wilson was induced to establish a perpetual blister at the lower part of the spine, and to apply strychnia to the vesicated surface, in gradually augmented quantities. The proportion was increased from one-sixth of a grain to one grain and a half, sprinkled upon the excoriated part three times in the day. In the course of five weeks, the improvement was so great, that the patient had obtained a tolerable command over the bladder and rectum, and could support himself upon his legs with the aid of a stick. The twitchings of the affected limbs were, occasionally, very severe. This treatment was continued for more than three months. When the patient was discharged, he was capable of walking, slowly, from one end of the ward to the other, without any assistance. The other case was that of a mason, who, in falling from a high scaffold, received a violent blow on the back, near the last lumbar vertebra, from a projecting piece of wood. When raised from the ground, his fellow workmen

perceived that the power of moving his legs was quite gone. On admission into the hospital, he had paralysis of the lower limbs, of the bladder, and of the rectum. From the benefit derived from the local application of strychnia, in the preceding instance, Mr. Wilson was again encouraged to adopt the same practice, and he ordered a small blister to be applied on each side of the affected vertebra, and the excoriated surface to be kept open by the aid of the savine and lytta ointments, in equal proportions. One-fourth of a grain of strychnia was sprinkled upon each of the sores, night and morning. In ten days, this quantity was increased to half a grain, employed in the same manner, which soon produced twitchings in the paralytic members. The good effects of the alkali became evident in the course of a month's trial of it in this proportion. The local action of strychnia was painful in this case. In two months from the period of admission, this patient was able to walk, with the aid of a small stick, and to retain both his fœces and urine. The appetite and general health improved during the entire course of the treatment. He was retained for ten weeks in the hospital, when the cure was complete.*

* Since this paper was transmitted to the Secretary of the Association, for publication, a successful case of the local application of strychnia, in partial paralysis, has occurred in the practice of Mr. Gordon, a former pupil of mine, now a surgeon in practice here. The patient had lost the power over the ring and little fingers of the right hand. Mr. Gordon applied a blister to the upper part of the arm, and one-fourth of a grain of strychnia was sprinkled, night and morning, on the blistered surface. The proportion was increased to half a grain at the same intervals. The patient was cured in less than a fortnight. Various liniments, and other remedies, had been previously tried without benefit. J. L. B.

An eminent surgeon, Mr. Liston, has employed strychnia, *externally*, with much advantage, in some instances of local paralysis, at the Edinburgh Royal Infirmary. Andral has given his weighty testimony in proof of the remedial efficacy of strychnia, *locally* applied in palsy from lead and from cold; and the experience of Bally, at the Hospital La Pitié, is equally confirmatory of its value in such cases. Dr. Shortt has published an interesting paper, containing remarks on the treatment of amaurosis by strychnine, with several successful cases, in the 34th volume of the Edinburgh Medical and Surgical Journal. He considers that the alkali can be serviceably employed only in amaurotic cases, which depend on paralysis of the optic nerve and retina, or in cases of congestive amaurosis, from pressure on these parts, with a loaded and inactive state of the minute vessels of the neurilematic envelope. Dr. Shortt usually ordered a blister to both temples, and sprinkled on each surface, first one-eighth of a grain, then one-fourth, and so on, until the quantity amounted, sometimes, to two and three grains and a half in the day. "I may safely assert," he remarks, "that in no case in which I have tried strychnia, has vision been injured, where the disease existed in one eye only, or where sight was not entirely destroyed. In no case did any constitutional evils arise from its use. I am inclined, also, to believe, from one or two instances, that it was beneficial in removing opacities of the cornea, probably by its highly stimulating property occasioning rapid absorption." Mr. Middlemore, of Birmingham, has also offered some valuable observations on the use of strychnia, in amaurosis. He

has stated the success that, in many instances, followed its employment, and pointed out the cases in which it is most likely to prove serviceable, as well as the best modes of applying it, and the requisite doses. "If a proper case of amaurosis," he says, "be selected, the employment of strychnia cautiously ventured upon and carefully watched, its absorption ensured by sprinkling it upon a perfectly raw surface, preventing it from being removed by friction and other causes, and not wiping it with a mass of greasy matter, it will prove a powerful means of combating this malady."* In the July number of the same journal, an instance of amaurosis, treated by the *internal* exhibition of strychnia, is related by Mr. Wickham. Vision was completely gone; full bleeding, leeches, blisters and purgatives, were fairly tried, but without benefit. Strychnia was then given, in the dose of one-eighth of a grain three times a day, and progressively increased to half a grain. In five or six days, the patient complained of violent flashes of light passing through the eyes and temples, with a severe pain in the head, which was relieved by the application of a few leeches and a blister, the strychnia still being continued. This man, according to Mr. Wickham's report, became weary of the medical discipline, and relinquished his attendance, but vision had so far returned, as to enable him to see the panes of glass, and to count his fingers when placed between the light and his eyes.

I cannot adduce the results of my own experience, of the value of strychnia in amaurosis, as I have

* Med. Gazette, Aug. 7, 1830.

never made trial of it in that affection, but the testimony in its favour is entitled to the utmost consideration. I wish particularly to direct the attention of the profession to the *external* application of strychnia in that obstinate form of paralysis of the *levator palpebræ superioris* muscle, occasioning the drooping or falling of the upper eye-lid, by which the eye becomes totally or partially closed. I have met with *three* examples of this kind, in which strychnia, sprinkled on a blistered surface, established immediately above the orbit of the eye, has been productive of great benefit. It is proper to commence with the application of one-sixth of a grain night and morning, progressively increasing the quantity to half a grain or a grain at the same intervals. The employment of galvanism may be advantageously combined with the application of strychnia in these cases.

I shall now present the results of my trials with strychnia in the Manchester Royal Infirmary, in paralytic affections, since the year 1830; and, in order to avoid a detail of the history of each case, I shall merely notice the *name and age of the patient, duration of the complaint, disease, and result.* Where any thing particular occurred in any of the cases, I shall allude to it in a note. The abbreviations, I. P. H. P. and O. P. used in the following tables, denote in-patients, home-patients, and out-patients.

In the *internal* administration of strychnia, I have mostly commenced with one-sixth of a grain twice daily, and this proportion has been gradually increased to half a grain or a grain at the same intervals; but half a grain of the alkali, taken three

times in the day, has generally produced sufficiently energetic effects upon the system. In the *external* use of the alkali, I have been in the habit of directing one-fourth of a grain to be sprinkled upon the blistered surface, night and morning, and the quantity has been increased to half a grain, a grain, a grain and a half, and two grains, applied twice in the day.

Table of cases of Hemiplegia treated with Strychnia.

No.	*Name.*	*Age.*	*Duration of Complaint.*	*Disease.*	*Result.*
1	John Johnson, O. P.	30	Two months.	Hemiplegia of left side.	Cured.
2	Mary Harwood, I. P.	43	Two years.	Ditto.	No benefit.
3	John Beech, I. P.*	25	Ten months.	Hemiplegia of right side.	Relieved.
4	Eliz. Worsley, H. P.	58	Sixteen mths.	Ditto.	Little benefit.
5	Thos. Walton, I. P.†	57	Two months.	Hemiplegia of left side.	Relieved.
6	Jane Macguire, I. P.	42	One month.	Ditto.	Cured.
7	Owen Connor, I. P.	33	Four months.	Ditto.	Relieved.
8	James Brown, O. P.	60	Two years.	Hemiplegia of right side.	No benefit.
9	Alice Burns, O. P.	33	Six months.	Hemiplegia of left side.	Greatly relieved.
10	Mary Kelly, I. P.	39	Three mths.	Ditto.	Cured.
11	John Royle, H. P.	61	Sixteen mths.	Ditto.	No relief.
12	Charles Astley, O. P.	29	One year and a half.	Hemiplegia of right side.	Cured.
13	Mary Brion, O. P.	59	Two years.	Ditto.	Little amendment

* Beech persevered in the use of strychnia for more than three months after he was discharged from the hospital, and, when I last saw him, he had almost entirely recovered the power of the right side.

† Walton died suddenly in the course of two months after quitting the hospital. He had not taken any strychnia during that time. On post-mortem examination, the basilar artery was found in an ossified state, and a large clot of blood was detected on the medulla oblongata.

Table of cases of Hemiplegia treated with Strychnia.

No.	*Name.*	*Age.*	*Duration of Complaint.*	*Disease.*	*Result.*
14	Jos. Medcalf, O. P.*	33	Thirteen wks	Hemiplegia of right side.	Cured.
15	Susan Scott, I. P†	60	Six months.	Ditto.	Little relief.
16	James Ingham, H. P.	39	Two months.	Ditto.	Cured.
17	Patrick Dillon, I. P.‡	48	Three years.	Hemiplegia of left side.	No benefit.
18	Mary Furbar, O. P.	43	Six weeks.	Hemiplegia of right side.	Cured.
19	Jonath. Jones, I. P.§	60	Two months.	Ditto.	No benefit.
20	Cath. Davis, H. P.	28	Thirteen wks	Hemiplegia of left side.	Much relieved.

* Medcalf continued the use of strychnia for more than thirteen months. During the last three months, the paralytic limbs were galvanised each night and morning.

† This patient died in a short time after her discharge from the hospital, with symptoms of cholera.

‡ Dillon was very inattentive to the directions given to him by myself and our intelligent house apothecary, Mr. Lloyd, and I have reason to believe that, on several occasions, he deceived the nurse with respect to taking the strychnia pills.

§ In Jones' case, many remedies had been previously employed, and with a similar unsatisfactory result.

Table showing the results of the combined internal and external use of Strychnia in twelve cases of Paraplegia

No.	*Name.*	*Age.*	*Duration of Complaint.*	*Disease.*	*Result.*
1	Jane Brown,*	13	Seven mths.	Paraplegia.	Cured.
2	John Edwards, ...	53	One year.	Ditto, incomplete.	Relieved.
3	Sarah Jackson, ...	16	Six months.	Complete.	Cured.
4	Thomas Pollitt, ...	24	Thirteen months.	Ditto.	Cured.
5	Isaac Sampson,†.....	60	One year.	Ditto.	No benefit.
6	Timothy Smith, ...	39	Two years.	Incomplete.	Greatly relieved.
7	Mary Walsh, ...	45	One year.	Complete.	No benefit.
8	Joseph Chadwick, ...	36	Six months.	Ditto.	Cured.
9	John Christie, ...	32	Nine months.	Incomplete.	Relieved, but afterwards became hemiplegic.
10	John Burgess, ...	35	One year and a half.	Complete.	Relieved.
11	Sarah Higgison, ...	48	Four years.	Ditto.	No benefit.
12	John Ellison, ...	33	Nine months.	Ditto.	Much relieved.

* This girl was brought to the infirmary from a distance of more

Table showing the result of the external application of Strychnia in eight cases of Palsy of the Wrists from lead.

No.	*Name.*	*Age.*	*Duration of Complaint.*	*Result.*
1	William Roberts,	40	Three months.	Cured.
2	Thomas Bennett,	36	Six weeks.	Cured.
3	James Constantine,	29	Three weeks.	Cured.
4	John Logan,	40	Two months.	Relieved.
5	William Hays,	32	Six weeks.	Ditto.
6	Thomas Dane,	54	Three months.	Ditto.
7	Charles Wood,	23	One month.	Cured.
8	Richard Cranshaw,	39	Nine weeks.	Cured.

Both Logan and Hays recovered the entire power of the wrists in the course of a fortnight or three weeks after leaving the hospital. I received no further information respecting Dane.

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than sixty miles. She had been under the care of a very eminent surgeon, who had previously tried the usual remedies, but without benefit.

† This man had led a previous intemperate life, and his constitution was much shattered.

OBSERVATIONS

ON THE

TREATMENT OF SYPHILIS

WITHOUT MERCURY.

BY THOMAS GREEN, M. D. BRISTOL,

Member of the Royal College of Surgeons, in London; late Assistant to Dr. Macartney, Professor of Anatomy and Surgery in the University of Dublin.

Perhaps there are few subjects in medicine, on which the members of our profession are, at present, more divided, or our notions more unsettled, than on the treatment of syphilis. One class of men believe that every stage of the venereal disease can be completely and safely cured without mercury; and that this mineral is not a specific for syphilis. In this class are included, among others, a large number of army surgeons, who are supported in their opinions by the indisputable records of the Army Medical Department. Others admit the possibility of curing syphilis without mercury, but still consider it a specific—that the disease is not safely cured without it, and, in all cases, resort to its employment;—while others still maintain that syphilis cannot be cured by any other than the mercurial treatment, and that the constitution remains contaminated by the venereal poison, unless mercury

be used to eradicate it. I fear that a great many are still to be found among the latter class, from whose minds the strong body of evidence now on record has, as yet, been unable to remove the impressions of education, or to alter opinions based on an erroneous theory. I am, therefore, induced to lay before the Association, a collection of facts concerning the treatment of syphilis without mercury. A small collection, it is true, and, taken by itself, of little value; but when viewed in connection with the mass of evidence now before the public, and to which I shall have to refer, it may possibly assist in convincing some hitherto unconvinced, that the primary and secondary symptoms of syphilis can be cured without mercury, and that any dread of danger, any apprehension of deplorable results from the venereal virus remaining in the constitution, if this remedy be not used, is perfectly chimerical.

The inferences I have drawn from what I have seen and read, are these. That every form and stage of the venereal disease, (except iritis) can be completely and safely cured without mercury; that most cases of the disease are better treated without mercury than with it; that, in some cases, mercury not only fails altogether to cure, but aggravates the disease, and, therefore, is not a specific; and that what have been considered as some of the worst secondary symptoms of syphilis, result from mercury itself, from the very means used to cure the disease.

My attention was first led to this subject, by witnessing the practice of Mr. Carmichael, at the Richmond Surgical Hospital, in Dublin; it would be injustice to this gentleman, not to bear testimony

to his judicious and excellent treatment of the venereal disease, be his doctrines right or wrong. Afterwards, I heard the lectures of Dr. Thompson, of Edinburgh, in which he zealously advocated the non-mercurial treatment of syphilis, and supported his views by a reference to 600 cases of the disease treated by him without mercury. Those who heard him, must have had their confidence in mercury considerably shaken, if they were not altogether converted to the doctrines he advocated. Subsequently I had an opportunity of seeing a good deal of the venereal disease, at St. Bartholomew's Hospital, in London, and the Venereal Hospital, in Paris. In these institutions, mercury is generally employed in the treatment of syphilis, but is moderately and cautiously used; however, a sufficient number of cases occurred, where mercury disagreed with the symptoms or constitution of the patient, and was hence omitted, to show that syphilis can be cured by other means. Being perfectly convinced of the safety of the non-mercurial treatment, and believing it to be the best, I determined, on commencing practice, to treat the disease, generally, without mercury: that this practice should form the rule, with mercury the exception. Having seen a good deal of the mercurial treatment, I wished to judge for myself, as to the comparative merits of the two methods of cure; I was wedded to no theory, and, therefore, I trust, prepared to take an unprejudiced view of both sides of the question. When I commenced the investigation, I did so solely for the reasons above stated. I had no intention whatever of publishing any thing on the subject, as it appeared to me that

the evidence already before the profession, was more than sufficient to convince even the most sceptical, of the possibility and safety of curing syphilis without mercury; but I find, even now, that many still doubt this fact, and having lately seen some deplorable results from the combined effects of syphilis and mercury, I determined to lay these observations before the public.

Before I mention my own cases, I think it right to place before the association a short account of what has already been done on this subject.

It has always appeared to me that John Hunter led the way to those enquiries on syphilis, which have been carried on during the present century, by the following remarks:—"that undescribed diseases, resembling venereal, are very numerous, and that what I have said is rather to be considered as hints for others to prosecute this enquiry further, than as a complete account of the subject."

Mr. Abernethy and Mr. Carmichael entered on the investigation of the venereal disease, and its treatment, with the zeal and talent belonging to both of them; and were led to this enquiry, by observing the ruinous effects of mercury, indiscriminately given, in all venereal cases. Mr. Abernethy considered that a large proportion of venereal affections were not truly syphilitic, and yet so closely resembled syphilis, as to render it impossible to distinguish one from the other by the symptoms. These diseases he denominated pseudo-syphilitic; he remarks,* "the fictitious diseases so exactly resemble syphilis, that no observation, however acute, seems to be capable of decid-

* Surgical Observations on the diseases resembling Syphilis, p. 44.

ing upon its nature ;" the only means, therefore, by which we can distinguish one disease from the other, he considers to be this, that true syphilis requires mercury for its cure, pseudo-syphilis does not If it be proved that syphilis can be cured without mercury, this test becomes an erroneous one, and the two diseases are what they appear to be, one and the same. Mr. Carmichael believed, that there were distinct primary venereal affections, arising from different poisons ; that each primary symptom was followed by a distinct set of secondary symptoms, and that one of these distinct diseases was true syphilis, requiring mercury for its cure. The other affections he called venereal diseases, and they could be cured without mercury. To these gentlemen must be given the credit of having proved to the profession, that a great number of venereal affections can be cured without mercury ; and hence the result of their labours was, to check, in some measure, the profuse and indiscriminate use of this remedy in all venereal complaints.

The late Mr. Rose, surgeon to the Coldstream Guards, first stated to the profession in this country,* the important fact, that all cases of the primary and secondary symptoms of syphilis could be cured without mercury. For a year and three quarters he treated, at the regimental hospital, in London, all cases of venereal diseases occurring in the soldiers of the Coldstream Regiment of Guards, without mercury ; he observes,† " I have certainly succeeded in curing

* Mr. Ferguson had previously stated, in the 4th vol. of the Med. Chir. Trans. that the venereal disease was successfully treated, in Portugal, without mercury.

† Medico-Chirurgical Transactions, vol. viii. p. 355.

all the ulcers on the parts of generation, which I have met with in that period, with the constitutional symptoms to which they give rise, without the exhibition of mercury." Mr. Rose treated more than 120 cases in this way, and no unfavourable results whatever followed the practice; he adds,* "caries of the bone, and some of the least equivocal symptoms did not occur. Constitutional symptoms were, in most instances, mild, and, in some, "so slight, that they would have escaped notice unless carefully sought for." In not one instance was there that uniform progress, from bad to worse, which was considered an essential characteristic of true syphilis. Mr. Rose's paper is well worthy of attentive perusal, as well on account of the facts it contains, as of the spirit of cautious enquiry evinced in it. Mr. Guthrie next published a paper on the same subject; he had treated nearly a hundred cases of primary sores without mercury, and considers it as an established fact, that† "every kind of ulcer of the genitals, of whatever form or appearance, is curable without mercury." He considers that, in some cases, a gentle course of mercury will expedite the cure, but does not consider it a specific for the venereal disease.

About the same time, Dr. Thompson was engaged at Edinburgh, in a similar investigation, and, shortly afterwards, published some "Observations on the treatment of Syphilis without Mercury."‡ He treated 155 cases of primary symptoms without mercury; secondary affections supervened in fourteen of

* Ibid, p, 420.

† Med.-Chir. Transactions, vol. viii. p. 571.

‡ Edin. Med. and Surg. Journal, vol. xiv.

these ; but all were cured without any unfavourable results. Dr. Thompson remarks, that there were not* "any of those deep and foul ulcers of the skin, of the throat, of the mouth and nose, or of the painful affections of the bones, which are stated by every writer on syphilis as the general products of that disease."

Shortly afterwards, Dr. Hennen published some remarks on the same subject.† He treated 105 primary sores without mercury ; secondary symptoms followed in eleven cases ; all were cured without mercury, except one obstinate and anomalous case. A more extended series of observations will be found in his valuable work on Military Surgery, which forms, as far as I know, the best essay on the subject we possess. The facts recorded by these gentlemen were, I believe, contained in the general army reports, to which I shall have next to refer.

To the Medical Officers of the Army, and the enlightened Director General of their department, Sir James M'c Grigor, must we be indebted, for having indisputably established the fact, that every form of primary and secondary syphilis could be cured without mercury ; by them has been placed on the records of medicine, such an assemblage of facts, such a mass of evidence, that the possibility of treating all forms of venereal disease without its famed specific, is now as clearly proved as any other admitted fact in medicine, and can only be disputed by those predetermined not to be convinced.

* Ibid, p. 89.

† Ibid, p. 201.

The reports I have next to call attention to, were circulated from the Army Medical Department, in April, 1819, and will be found in Dr. Hennen's work; they state as follows:—"That since Dec. 1816, to Dec. 1818, there appear to have been treated, for primary venereal ulcerations on the penis, (including not only the more simple sores, but also a regular proportion of those with the most marked characters of syphilitic chancre, as described by Hunter and other writers,) 1940 cases." "That of these 1940 cases so treated, 96 have had secondary symptoms of different sorts;" of these 96 cases of secondary affections, mercury was had recourse to in 12, for various reasons stated in the report. In the 1940 cases of primary symptoms, mercury was used in 65, for reasons also assigned; if we deduct the 65 and 12 cases in which mercury was used, from 1940 reported, 1863 *cases remain completely cured without mercury.* The report goes on to state, "that the average period required for the cure of primary symptoms without mercury, when bubo did not exist, has been 21 days; with bubo, 45 days." That the average period for the cure of secondary symptoms, without mercury, has been from 28 to 45 days. *That every man treated without mercury, has been fit for immediate military duty on dismissal from the hospital.*" In the same period, 2827 cases of primary symptoms were treated with mercury; secondary symptoms occurred in 51 of them. The report states that, in the majority of these instances, there were good grounds for believing that *the constitutional symptoms "were more severe and more intractable than when mercury had*

not been used for the primary sores.." Two men thus treated *with mercury*, were discharged the service, *on account of the injury their constitutions sustained from the treatment.* The average period required for the cure of primary symptoms, without bubo, was 33 days; with bubo, 50 days; and for the cure of secondary symptoms, 45 days. Here, then, we have *a record of* 1863 *cases, of every form and stage of syphilis, cured without mercury;* and in not one instance did any unfavourable results follow the treatment; foul ulcerations, caries of the bone, broken down constitutions, and a loathsome death, were not here to be seen. The evidence thus presented is too strong to be disputed, and, perhaps, could have been collected from no other source than military hospitals; and in no other practice could the consequences of the treatment be better observed, as, of course, the men remain under the personal observation of their surgeons after they are cured. I need hardly say, that the enquiries were conducted with that fair, candid, and impartial spirit, which should ever mark the investigations of men searching for truth; if any triumph did follow their exertions, it was that of truth over error.

I have now to give a short account of my own cases; not, for a moment, thinking that any thing I have to offer, can confirm the fact, that syphilis can be cured without mercury; this is already too well established in the history of medicine, to need any feeble testimony of mine to confirm the doctrine; but many are still unconvinced, and many men of observation and experience, while they admit the possibility of the practice, doubt its safety; and

from proper, though, I believe, erroneous, motives, would be afraid to trust a patient labouring under secondary syphilis, without a course of mercury. If any thing I have to say, can assist in removing this impression, and in inducing surgeons to try the practice themselves, my object is attained. For the last seven years, I have treated nearly all the cases of syphilis, that came before me, without mercury; in a few instances I have employed this remedy, where the symptoms got into an indolent or chronic state, here I tried the stimulus of mercury, precisely as I should have done, whether the symptoms were of venereal origin or not, with a view of inducing healthy action in the local disease; or I have given it to alter the secretions from the stomach and bowels, or to improve the general health where it seemed required. I have kept an account of 100 cases of the venereal disease, treated by myself, without a particle of mercury used internally or externally. In the selection of these cases, two objects have been kept in view, namely, that the primary sore should, in some degree, possess the characters of the Hunterian chancre, "a circular, depressed, and sloughy sore, with an indurated base;" and I have preferred taking notes of those cases where patients resided in Bristol, that I might have an opportunity of watching the consequences of the treatment, to ascertain if any symptoms of a contaminated constitution should result from syphilis, cured without its supposed specific. As I am limited to a small space in the present vol. of our Transactions, (not having stated my intention of publishing any thing till very lately,) I must give a brief and condensed view of the

symptoms, omitting, altogether, any detailed history of them or of the treatment.

In these cases, I have remarked, not a particle of mercury was used, either generally or locally. The primary sores were treated with sedative and astringent lotions, or simple ointment, as the one or other seemed best to agree with them; local applications, containing mercury, were not used, as any benefit obtained from them might have been attributed to its specific effects All the sores thus treated possessed more or less resemblance to the true syphilitic chancre, as described by Mr. Hunter. From a fortnight to a month was the time in which they were generally healed; some cases lasted longer, but this was about the average period required for their cure. One case of chancre resisted all applications for four months; every thing in the slightest degree stimulating or astringent, disagreed with the sore; the only thing which suited it was plain water dressing.* Finding all the remedies he had used of no avail, I advised this gentleman to try change of air; he went to the sea side, and in three weeks the sore was healed. If this obstinate case of chancre had occurred in a person of a different constitution, I should, perhaps, have tried mercury; but he was of an irritable and strumous habit, and the sore was of a still

* Water dressing is a local application to wounds and ulcers, recommended by Dr. Macartney, the Professor of Anatomy and Surgery in the University of Dublin; it is merely plain water applied under oiled silk, and will be found to agree with irritable sores which will bear nothing else. Dr. Macartney has long entertained and taught notions peculiar to himself, on the nature and treatment of inflammation, which, it is to be regretted, this accomplished teacher has not yet published to the profession.

more irritable character, I, therefore, determined not to use it. In some of the above cases, the local inflammation, accompanying the sore, ran so high, as to require blood-letting, local or general; in some others, thickening and induration remained for some time after the chancres were healed, but this subsided without any thing being done for it. I may here remark, that these sores took a longer time to heal than superficial ulcers and excoriations; sores of the latter description generally healed within a week or fortnight We sometimes find even these ulcerations exceedingly tedious and unyielding; but, when this occurs, it most generally arises from something wrong in the general health, from disorder of the digestive functions, or from stricture in the urethra; of course we must remove the cause before the disease will yield. It sometimes happens that the slightest form of excoriation, a mere abrasion of the cuticle, will, after a while, degenerate into a sore, possessing all the characters of a true chancre; this condition is very often caused by stimulating and improper treatment; we can, by artificial means, produce the same kind of sore. Of 100 cases of primary venereal sores thus treated, buboes supervened in sixteen of them; of these, six only suppurated. The buboes which did not suppurate, were removed, on an average, in about six weeks; in two cases, however, a chronic enlargement of the inguinal glands remained for a longer period, one four, and the other seven months; but both of these patients were of decidedly scrofulous habits. The buboes which did suppurate, were healed within two months from their appearance,

except one, which remained open four or five months; this patient was also of a scrofulous constitution; ultimately, the whole sixteen cases of bubo were cured. Constitutional affections, of one kind or another, followed in nine cases; these secondary symptoms were, cutaneous eruptions, sore throat, pains in the limbs and periostitis. The affection of the skin assumed varied forms; it was papular in three cases, pustular in two, vesicular in one, vesicular and scaly in two, and in the last it was a mixed form of eruption, papular in the beginning, followed by a general redness, and ending in a scaly condition of the surface. These eruptions, at their commencement, were generally accompanied by pains in the limbs, and more or less of febrile action. In some the cutaneous affection was so slight, as hardly to deserve the name of disease, and was only alluded to by the patient in a casual manner; two of these cases were papular, a few pimples scattered over the surface of the limbs and trunk; and one was vesicular, resembling a very mild case of varicella. One case of papular eruption was a well-marked specimen of the "*Lichen simplex*" of Dr. Bateman; it was attended with some slight febrile feelings at its first appearance: it lasted about three weeks, and then faded away. One of the cases of pustular eruption was also strongly marked, it closely resembled distinct small-pox; this resemblance has been noticed by Dr. Hennen. In this instance, I believe no person could have distinguished the nature of the disease by the skin alone, its history and duration could alone decide the question. The eruption appeared on the trunk, face, scalp, and extremities of this

patient; one crop of pustules was succeeded by another; the disease lasted, altogether, three months, was accompanied with a good deal of fever, and pains in the head and limbs; within four months the eruption was removed, and the patient completely cured. This pustular form of eruption I have generally seen to occur in persons of strong constitution, and such was the case in this instance. The two cases of vesicular and scaly eruptions occurred in persons of delicate health, and evidently having a tendency to scrofula; they were the most obstinate cutaneous affections I had to contend with, one lasted between three and four months, and the other nearly seven. The eruption first appeared in the form of vesicles, with an inflamed base; it continued in this state about three weeks, when the vesicles dried, and it appeared that the disease was about to pass off; but the inflamed base now began to spread, and what seemed to be the scab left by the vesicle, extended over the surface until it assumed a regular scaly form, that of syphilitic lepra. These cases were obstinate, and, it may be said, imperatively called for the use of mercury, but I determined not to employ it. Both cases occurred in persons of a strumous habit, and the eruption was of the character which I have seen, more than once, degenerate into phagedenic ulcerations of the skin under the use of mercury; both, however, terminated well. The mixed form of eruption I have alluded to, passed through its stages mildly, and was gone in five weeks.

The next constitutional affection I have to mention was sore throat; this symptom occurred in four cases, in three of them conjoined with cutaneous

eruptions. This affection of the throat was the same in all cases, and presented some characters which, it appears to me, are peculiar to syphilitic disease, though some authors think this ulceration does not belong to syphilis. The tonsils are, at first, enlarged; there is a superficial ulceration extending over these glands, and passing back to the pharynx, and anteriorly extending over the palatine arches: the mucous membrane looks red and granulated; it presents the appearance which granular conjunctiva does on the eye-lids. After a short time, a week or more, the inflamed and ulcerated surface becomes covered with a thin layer of coagulable lymph, which adheres to the part; the voice is rough, the throat feels sore, and is painful during the act of deglutition. In some instances, patches of this kind of ulceration extend to the mouth, giving an aphthous appearance to the part. As this is the form of ulceration which I have seen in most cases of syphilis where mercury had not been given, I am led to consider it as the true syphilitic ulcer of the throat. Mr. Rose mentioned that an ulceration of this kind occurred in some of his cases treated without mercury; in one, he remarks, the* "tonsils looked as if covered with a coat of ill-organized lymph;" in another case he observes, "the ulcers had irregular margins, and both tonsils had an appearance as if covered with a thin coat of lymph." This disease of the throat has the peculiar characters above mentioned, and is, therefore, quite a distinct affection from the sloughy excavated ulcer of the tonsil, which has usually been considered the venereal sore throat. Some writers,

* Med. Chir. Transactions, vol. viii. p. 413.

who advocate the mercurial treatment of syphilis, admit, however, that the foul excavated ulcer of the tonsil, does, occasionally, arise from mercurial irritation; that there is a mercurial ulcer of the tonsil not to be distinguished from the venereal one. Most practical men, I believe, now admit this fact, and hence mercury is not so generally resorted to for this form of syphilitic disease; where, however, the contrary opinion exists, and mercury be pushed into the system; extensive destruction of the soft parts, and caries of the palate bones, are frequently the results; and, in too many instances, death has relieved the unfortunate sufferer from a state in which he was loathed by others, and loathsome to himself; a miserable poisoned victim to erroneous doctrines. The superficial ulcer I have described, sometimes, when placed under the action of mercury, becomes changed into the excavated ulcer, and goes on progressively extending its ravages, until the mercurial action be arrested. In another part of this paper, I shall mention a very strong instance of this fact, which occurred under rather unusual circumstances. The four cases of sore throat I have alluded to, were entirely removed; the ulceration never went beneath the surface.

The next and last form of secondary syphilis, which appeared in these cases, was periostitis; it occurred in two cases, in one distinctly, and in the other faintly marked. In one of these, the bones of the head were affected, there was pain, swelling and tenderness, and the symptoms were aggravated on getting warm in bed; the complaint was obstinate, but at length yielded to counter-irritation, kept up

by a succession of tartar-emetic pustules. The other case was a mild one, it was situated principally in the shaft of the tibia; it did not give much inconvenience, and passed off without any treatment.

There was not one case of iritis among the secondary symptoms which appeared. In 154 cases treated by Dr. Thompson without mercury, iritis followed in one; and in 417 cases similarly treated by Dr. Hennen, iritis occurred in two instances only.

The cases I have now related, have been treated, at different times, within the last seven years, most of them before the last three, as latterly I have not adopted such a rigorous anti-mercurial treatment; I have used local mercurial applications, and where mercury, as a purgative or an alterative, was likely to improve the general health, I have resorted to it. To make this history a fair and impartial one, it is right that I should mention what unfavourable symptoms, if any, followed this treatment. In one case of tedious cutaneous eruption, the chain of lymphatic glands of the neck became swollen, and they have remained enlarged since. In another case of obstinate scaly and vesicular eruption, the skin remained discoloured, in patches, for nearly twelve months. With these exceptions, not one unfavourable symptom has resulted from the treatment; most of the constitutional affections occurred some years ago, and in persons whom I am in the habit of seeing constantly; and in not one of them has any thing whatever occurred to show a contaminated constitution.

It affords me pleasure to feel, that not one of my patients suffered any ill effects from withholding

mercury. In one case, that of tedious pustular eruption, I thought of giving mercury to try to expedite the cure, as I should do whether this eruption were syphilitic or not; this gentleman was of strong mind, and I made him understand the position in which the question, as to the use of mercury, stood, leaving it to himself to decide. I told him he would get well without mercury, but that his complaint might be tedious, and, possibly, that the use of this remedy might hasten a cure; I told him, also, of the prejudical effects which sometimes followed the employment of mercury; he decided not to take it; the termination of the case justified the prognosis; he was completely cured, and has been in good health since the period of his illness, now four years.

The two cases of vesicular and scaly eruption I have mentioned, occurred in persons of decidedly strumous habits, where, above all others, mercury frequently does mischief, I resolved, therefore, not to employ it, and both cases, ultimately, did well without it.

While all the facts I have now mentioned prove that syphilis can be cured without mercury, I do not, for a moment, contend that its use should be abandoned altogether in the treatment of venereal complaints. Mercury should be given in these complaints, with the same intention, as if precisely similar symptoms occurred from any other cause. The well-known power of mercury, when used cautiously and moderately, to improve the general health, to remove chronic inflammations, and diseases of an indolent kind, indicates its use, in some few cases, for the symptoms of syphilis, as if they occurred

from any other disease, without reference to any *specific character*. While I admit its use in some cases of syphilis, not for a moment *as a specific*, but on the general principles above stated, I contend that the cases requiring it are but few; a very large proportion of venereal diseases can be as well, if not better, cured without mercury, and *certainly more safely*, because the risk is not incurred of producing the truly melancholy results, which, in some constitutions, follow the treatment of syphilis with this mineral. I think its use, in primary symptoms, should be given up altogether, at least, until there appears some indication for its employment. It cannot now be maintained that a chancre is cured one day sooner where mercury is given, than where it is not; as far as any comparison of evidence goes, it would appear, that these sores are sooner cured, where mercury is not given. If this be true, we gain nothing by using this remedy, and incur the risk of inflicting a severe injury on the patient, as every practical surgeon knows well, that chancres do, sometimes, assume a gangrenous and phagedenic character under the mercurial irritation, occasionally ending in the loss of a portion, or the whole, of the penis, before the destructive processes can be arrested. The only intention with which mercury can be given, in this stage of the disease, is to prevent the introduction of the venereal poison into the system. But, has mercury this preventive influence? Unfortunately, the history of the venereal disease, under the most full and efficient mercurial treatment, proves that it has no such power. It is too well known that if mercury succeeds, once, in preventing

secondary symptoms, it fails, altogether, in too many instances, to allow us to place reliance on it as a preventive of constitutional symptoms. It is certain that secondary symptoms occur whether mercury be given or not; but whether they follow more frequently in the one case or the other, is, as yet, entirely undecided.

As far as the army reports go, it would appear that secondary symptoms followed more frequently where mercury had not been used; but it must be remembered, that it was considered that the secondary symptoms following the use of mercury, were more severe and intractable than when it had not been used; no argument can hence be drawn in favour of mercury. The cases in which mercury may be employed with advantage, appear to me to be those in which the symptoms get into an indolent state, and become a chronic disease. Here mercury may be of service, if there be nothing in the constitution of the patient to forbid its use. Its chance of doing good in these cases, results not from any specific or anti-syphilitic power belonging to the remedy, but from the well-known influence mercury possesses of controling and altering morbid actions, altogether devoid of any specific character; but, if there be any difference between its influence over specific diseases, and those of a different nature, experience tells us it is this, that while mercury alters and subdues simple morbid actions, it alters and sometimes aggravates those of a specific nature, such as the phenomena resulting from the venereal infection. I have here nearly repeated what I have before said, but I wish to make myself distinctly understood on this point,

as to my reasons for admitting the use of mercury in some cases of syphilis, though I incur the charge of tautology by this repetition.

Secondary symptoms supervening where mercury has not been used, are, in most instances, mild, and generally yield in a short time; but where they do not, mercury cautiously given may be attended with benefit, if, however, when the system becomes affected from the remedy, the constitutional symptoms are aggravated, we ought immediately to stop its use, and treat the disease by other remedies; should we, however, persist in the mercurial course, we incur the risk of totally changing the character of the disease, from a *mild chronic*, to a *severe and intractable one.*

The superficial ulceration of the throat before described, and which I consider to be a true syphilitic affection, frequently becomes changed, under mercurial irritation, into the deep excavated ulcer of the tonsil. I shall briefly mention a case of this occurrence, under rather remarkable circumstances. A gentleman had a bubo; his mouth was affected by mercury; the bubo suppurated, and, in a short time, degenerated into an extensive phagedenic ulcer; mercury was immediately stopped; and, after a while, the phagedena was arrested. The superficial ulceration appeared in the throat shortly afterwards; this continued about a month; the sore in the groin was nearly healed, when suddenly a renewal of mercurial influence took place, without a grain of mercury being given; the gums were swollen, there was mercurial fætor, the metallic taste, and much more profuse salivation than at first. The sore in the groin immediately became as foul and phagedenic

as ever; the superficial ulceration of the throat was, at the same time, converted into a deep, sloughy, and spreading ulcer in each tonsil; and subsequently a vesicular and scaly eruption appeared. Shortly after the re-appearance of mercurial action, this case was seen by Dr. Prichard, of this city, a physician whose reputation for professional and intellectual attainments stands high, and certainly not higher than it deserves. Dr. Prichard afterwards attended the case with me, and we agreed that mercury must on no account be given in this case, and that we must treat the disease by other means. This gentleman, I am gratified to say, was, after some time, completely cured, principally under the use of quinine and sarsaparilla. The case was one of a good deal of interest to myself, and becomes of value, on account of the remarkable fact which occurred, namely, the renewal of mercurial irritation, without any fresh quantity of mercury being taken, the interval being about six weeks. This fact has been before observed; some cases of a similar nature will be found in Dr. Christison's valuable work on Poisons. Had the use of mercury been continued in this case, but one termination could have occurred.

The chief argument I bring forward against the general use of mercury in syphilis, is this, that results such as the above are of frequent occurrence where this celebrated specific is used, which seldom or never happen when mercury is not employed.* If we can

* It may be necessary to remark that venereal sores are, sometimes, attacked by that form of phagedenic ulceration called hospital gangrene; but this has nothing to do with their venereal origin, as sores of every kind and description are liable to the same form of degene-

cure the disease as well, as safely, and as completely, without mercury as with it, why should we expose a patient to the risk of such deplorable results, as every man knows occasionally follow the mercurial treatment of syphilis?

Many who admit the possibility of curing syphilis without mercury, still maintain that this mineral is a specific remedy for the venereal poison. A belief in specifics is, to say the least of it, a very unscientific faith.

To suppose that all the varied morbid actions which result from the venereal infection, differing, as they do, in their essential characters, and depending so much on the constitution of the individual, are to be treated by one specific remedy, is a creed altogether untenable, and only worthy of a place in the manual of some Turkish Physician, or the horded secrets of some copper-coloured Indian Sage. That both primary and secondary syphilis can be cured under the use of mercury, I admit, no one can doubt it; but that mercury has any *specific* effect in preventing, arresting, or removing, the venereal virus; has any power whatever over the syphilitic poison itself, is a position which I distinctly deny; such a theory

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ration: therefore, where venereal sores, treated without mercury, assume this character, it must not be set down as resulting from any venereal infection, but to the application of a specific disease (phagedena,) to a simple ulcer. During my attendance at St. Bartholomew's Hospital, we used frequently to get cases of this disease from Roan Alley, a region inhabited by the lowest order of prostitutes. Mr. Lawrence remarked, that the hospital obtained a regular supply of phagedena from this quarter. The most successful method of arresting this disease, is by the application of *undiluted* nitric acid, as recommended by Mr. Wellbank.

has never yet been proved, and I have little doubt it never will be; it is a mere hypothesis, unsupported by facts. While the doctrine was taught and universally believed, that the venereal poison gave rise to a disease progressively going from bad to worse, until arrested by mercury, then this hypothesis might be maintained, that mercury had the power of grappling with, and forcibly ejecting, the venereal virus from the system; but the whole of this theory falls to the ground before the facts which modern investigations have proved. We now know that primary symptoms are as soon removed, that the constitution is affected in nearly the same proportion, and that secondary symptoms are as well cured, *whether the specific be employed or not.* There is, however, this difference between the two methods of treatment, that gangrenous and phagedenic ulcerations not unfrequently occur where the specific is used, while they rarely, if ever, follow the opposite plan of treatment;—that where the morbid actions of scrophula, syphilis and mercury meet, a ruined constitution is too often the result;—and lastly, that what has been considered as one of the worst symptoms of secondary syphilis, namely, caries of the bone, has never been proved to have occurred in one case where mercury had not been used; hence we have a right to draw the legitimate inference, that this deplorable symptom is the result of the specific, and not of the disease. Dr. Hennen gives a summary of the effects of mercury as follows;* "but the most troublesome of all its effects, is the phagedenic ulceration, which it often induces both in chancres and

* Hennen's Military Surgery, p. 518.

open buboes, and the dispositions to fresh ulcerations of a spreading and intractable character, which it gives rise to in parts where the skin had not been previously broken. In the throat most severe ulcerations are excited by it, erosions of the gums and palate are produced, and the papular and other eruptions of the skin, which so often appear as a secondary form of the disease, are frequently exasperated into open ulcerations. I have not seen a single case of ulceration succeeding to a cutaneous eruption, in the military hospitals, since the non-mercurial treatment has been adopted, except where mercury had been long and irregularly tried." Here are proofs of specific effects, certainly, but not of a curative kind. The possibility of curing syphilis without mercury, is now, I believe, generally admitted by writers and teachers of surgery. Mr. S. Cooper, in his learned and valuable Dictionary of Surgery, remarks, that no fact in medicine is better established. Mr. Cooper's Lectures on Surgery, now in course of publication in the London Med. and Surg. Journal, contain an extended series on syphilis, which are well worthy of attentive perusal by every man who wishes to obtain the fullest information on this subject. I feel pleasure in stating that the opinions I have here advocated, are entertained by an active and enlightened member of our association, Mr. Hetling, surgeon to the Bristol Infirmary. This gentleman informs me that, for a great many years, he has treated, successfully, all primary sores without mercury Mr. Hetling generally employs nothing but lint and tepid water, or a weak acid lotion as an application to chancres; he considers

that, in many cases, simple sores and excoriations are aggravated under stimulating treatment, into tedious, ill-conditioned, ulcers. Mr. Hetling totally disbelieves in any *specific* effects of mercury over the venereal disease, and does not, on any occasion, use even local mercurial applications.

In the beginning of this paper, I excepted iritis, from the secondary symptoms not requiring mercury. In iritis mercury must be given, not, however, as an antidote to any venereal virus, but to arrest the effects of inflammation in this delicate organ; in no disease are the beneficial effects of medicine more remarkable than in iritis.

Mr. Lawrence has treated at length on this subject, in his recent work on Diseases of the Eyes, a work worthy the pen of that distinguished surgeon, and which is valuable to the profession, as well on account of the mass of practical information it contains, as of the fruits of extensive research to be found in its pages.

While I have endeavoured to prove that mercury is not a *specific* for syphilis, I admit, to the fullest extent, its value in the treatment of other diseases. Those only who have tried this powerful remedy in inflammations of the head, chest, or abdomen, in iritis, in chronic enlargements of the testicle, &c. or as a discutient wherever thickening or induration is to be removed, can be fully aware of its value. I think *the better we become acquainted with the effects of mercury, the more shall we resort to it in other complaints, the less so in venereal diseases.*

Want of room, in the present paper, compels me to omit, altogether, the details of treatment which I

have employed. I shall only remark that, in the treatment of syphilis, as of all local and chronic diseases, the doctrines of Mr. Abernethy should never be forgotten. When there is disorder of the digestive functions, with a bad state of the general health, in proportion as the administration of mercury can remove the one and improve the other, should it be employed in the treatment of syphilis; but this fact must ever be borne in mind, that, in some habits, the smallest dose of mercury will produce almost fatal results, and that this mineral, if pushed too far, is itself a poison.

I have now to conclude this paper. I am fully aware that it contains nothing new, that it only repeats a "thrice told tale;" but the records of medicine of the present day, contain the following fact.* "I have seen it (death from mercury,) in a woman who was salivated to death, because her medical attendant, a firm believer in the powers of mercury as an antidote, did not consider that the antidote is itself a poison if not given in moderation."

While we hear of, and see, such facts as the above, any remarks which can call the attention of the profession to the mass of evidence on record, may not be altogether superfluous; and if they prevent the sacrifice of one more victim at the shrine of a pernicious doctrine, good has been achieved.

* Christison on Poisons, p. 319.

OBSERVATIONS

ON

CHRONIC PERITONEAL INFLAMMATION

AND ITS TREATMENT,

WITH CASES.

BY EDWARD THOMPSON, WHITEHAVEN,

Member of the Royal College of Surgeons, London, &c. &c.

Chronic inflammation of the Peritoneum is one of the most interesting affections, whether as regards its nature or treatment, that fall to the consideration of the medical inquirer. The insidious mode of attack, the ravages effected in important organs by this dangerous disease, and the difficulty of treating the affection, even when discovered at an early period, point it out as one of the most important maladies to which human nature is exposed.

The older authors were in the habit of noting its effects, although not well acquainted with the nature of the disease, as we find by the frequent allusions to the altered state of the viscera, apparent in those who had died of obscure abdominal affection. The accurate dissections made by the early investigators, excite surprise that the seat of the disorder should have so long escaped observation. That it was not unfrequently met with, may be gained by referring to the numerous cases related by various authors.

In Fantonius we find, in the case of a young woman, who had died after frequent pain in the bowels, &c. for a long period, "*Cuncta fere intestina in unum veluti corpus conglobata, et inter se arctissime conglutinata.*" Bonetus makes mention of several cases of a like kind, where, "*Intestina omnia conglomerata et veluti inglobum acta: itemque (observat. 20) intestina ita ad superiora retracta ut vix mediam abdominis capacitatem implerunt.*" *In actis Academiæ Tom.* 1, *Observat.* 87, and *Tom.* 6, *Observat.* 134. "*Inventa esse omnia intestina arcta invicem cohærentia, aut præcipue tenuia tam inter se, quam cum mesenterio ubique tam tenaciter concreta, ut cum ipso ceu unam massam, &c.*" Morgagni found, in one case, "*Tenuia intestina in tumorem assurgentia, illuc omentum olim repulerant, quod in se complicatum in unum illud coaluerat corpus, &c.*" "*cæterum uniformis erat ubique adspectum substantiæ, sed durities alibi quasi ligamenti alibi prope modum cartilaginis.*" There are, in the Sepulchretum, a number of instances related of obscure affections of the bowels, which had not elicited any decided inflammatory action, or fever, prior to the event. A close examination of these cases warrants us in supposing that chronic inflammation had existed for some period, and that the alteration in structure was caused by it. Certain it is there is no way of accounting for the diseased condition of the intestines and peritoneum, but by such supposition. Morgagni regarded a similar state of diseased abdominal viscera, to have originated, as he says, in latent inflammation. His attention was particularly drawn to such affection by Valsalva and Albertini,

the latter of whom stated the symptoms to be the following, which Morgagni mentions as agreeing with his observations: "*Pulsus humilis, et debilis potius, et qui si bene attendas, sibi obscure dissimilis sit, abdomen autem tensum, et durum, et cum dolore quodam; facies denique insoliti aliquid sed in aliis aliud ostendens; ut interdum oculos quasi exterrefactos, alios livorem quendam circa labra animadverterim, hæc fere nam aliquando linguam etiam adnotavit haud bene se habentem, et quamdam sitim mihi accidit, ut in ejusmodi casibus se observanda præbuerint.*" These are the symptoms of chronic inflammation of the peritoneum, which Morgagni calls latent inflammation of the intestines, he following Coiterus in believing that serous membranes were not the primary seat of inflammatory action. In epistle 39, art. 30, he particularly adverts to agglutination of the intestines to the peritoneum, and to themselves, as being consequent to inflammation.

From the works I have before me, a large mass of information might be given on the affection under consideration, proving that long before Dr. Pemberton drew notice to the disease, it had attracted attention, and that although the membrane known now to be the seat of the disorder, may not have been particularly named, the cause of the alteration in structure was considered to be inflammatory action of a peculiar kind; but enough has been advanced to show that the affection had frequently been adverted to by the early writers, and that one of them, at least, had partly anticipated both Bichat and Pemberton, in the opinion that the ravages witnessed in the abdominal viscera, of those who had

died of obscure affection of the belly, were the effects of latent inflammation.

The peritoneum, along with other tissues, is subject to tubercular affection. Many cases are related in the Sepulchretum. Anhornius speaks of a case in a young man, in which the whole of the peritoneum was beset with them. Goetzius met with tubercles of a schirrous hardness, covering the peritoneum. Bilgerus, Wolfins, Stegmanners, and others, found them in various states of firmness; in some resembling hardened glands, or fleshy substances; in others they were formed of matter like paste, or cheesy substances, interspersed with others filled with pus. These would appear to have been the true tubercle, differing materially from what more frequently obtains in disease of the peritoneum. In the common cases of tuberculated peritoneum, (as generally received,) the nodules collected in larger or smaller masses, differ both in physical and chemical qualities from the tubercles described by Bayle, Laennec, and Abercrombie. The opinion of Laennec, and which is the received one, is, that "*Quelle que soit la forme sous laquelle se développe la matière tuberculeuse, elle présente dans l'origine l'aspect d'une matière grise et demi-transparente qui peu à peu devient jaune opaque et très dense.*" This is not what is met with in a number of those cases of peritoneal inflammation which we are in the common custom of examining. The specimens presented according to Abercrombie, "irregular surface, elevated into various shaped nodules, of a semi-pellucid appearance and firm texture. By boiling in water, these nodules were nearly dissolved, leaving only a

small central part, to which they seemed to have been attached, and which had undergone little or no change during this first boiling. The part that was dissolved appeared to consist entirely of muco-extractive matter, and the part that remained, appeared, on farther examination, to be the same substance in a more concrete form, with a small trace of albumen." The description of the latter is directly opposed to that given by Laennec of the proper tubercle, and is so different to the specimens of pure tubercular concretions examined by Abercrombie, that I think we are emboldened to doubt the identity of the two, and that it is more consistent with our pathological knowledge and reason, to suppose them to arise from opposite causes, as well as to be physically different in nature and character. True tubercle has its origin in a cause which probably is not inflammation; the other is a mere interstitial deposit, arising from inflammation of a peculiar kind, modified by circumstances to which the advance of our knowledge affords no solution, constituting a difference, however, of moment as a pathological fact. Whether the nodules of coagulable matter found in the abdomen in certain states of chronic inflammation, bearing only the appearance of tubercles in their shape, &c. be the result of action more intense than mere chronic inflammation, and yet below active inflammation, investigation has not discovered; certain it is that chronic inflammation does not always produce them, although, according to Scoutteten, they are a frequent consequence of chronic inflammatory action of a few months standing, (*Archives Generales*, Dec. Feb. 1823-4.) I

should be disposed to think their absence or presence is regulated solely by the greater or less degree of passive inflammation, and the state of habit in which it exists. That pure scrofulous tubercles are not the product of the same action, that obtains during the formation of the above bodies, I firmly believe, and I think facts support me in the assumption. Tubercular concretions have been found in all parts of the body, unaccompanied by any discoverable inflammatory appearance, the nodules are never so, the part to which they are attached always exhibiting some shade or other of inflammatory action. They are unlike in their internal formation, as well as in other qualities. The true tubercle in the first state of enlargement, according to Abercrombie, presenting the soft fleshy appearance; "when plunged into boiling water instantly contracts considerably in its dimensions, its texture becomes much finer, and the colour changes from the flesh colour to an opake white or ash colour. By boiling for a short time, it loses a great part of its weight, but a residuum is left which has increased much in firmness during the boiling, has lost entirely the fleshy colour, and exhibits the appearance, consistence, and properties, of coagulated albumen. The part that is lost seems to consist partly of water, but chiefly of the muco-extractive matter; sometimes, but not always, there is a mixture of gelatine, and, in some specimens, the coagulated part gave traces of fibrine, but in small quantity." These differ, as has been shown, from the simple tuberculated specimens, found in common disease of the peritoneum. The nodules occasionally resemble the miliary granulations of Bayle, and

yet the resemblance is not complete; they do not contain in their substance that colour or tint described by Laennec, as indicative of scrofulous granular tubercle. He says of the latter, "*Lors même qu'elles sont le plus diaphanes et tout-a-fait incolores, quelques unes présentent une légère teinte grisâtre qui ne permet plus de les distinguer des tubercles miliares ordinaires, ou un reflet opalin. En incisant ces dernières, on trouve au centre un point jaune et opaque, indice non equivoque du commencement de leur transformation en tubercles jaunes crus.*"

A dissection given by Dr. Alison, elucidates the subject of the appearance of tubercles, commonly so called, with such truth, that I cannot resist the temptation of transcribing it from his Essay on Scrofulous Diseases; "Almost the whole of the peritoneum, except the covering of the stomach, was covered with an exudation resembling the coagulable lymph so often thrown out on it by inflammation; except that it was of a somewhat yellowish colour, and was disposed chiefly, though not entirely, in the form of round tubercular eminences of various sizes, none of them so large as a split pea. By the intervention of this matter, numerous adhesions of the liver to the parietes of the abdomen, and bowels to each other, had taken place. In various places where the exudation was thickest, the peritoneum was thickened and very vascular, In the pelvis there was an irregular mass, of the same appearance, which hardly adhered to the peritoneum. The ligamenta lata of the uterus were much thickened, and of a deep red colour, and on cutting into them, much thick pus was found between their layers." This is the con-

dition which I have several times observed in peritoneal inflammation, and, at one time, thought it was the incipient state of tubercular disease; but examination has convinced me that the eminences oftentimes spoken of as tubercles, are formations produced merely by the presence of inflammation, and that the substance which glues the convolutions of the intestines to each other, differs scarcely at all from that which forms them, and from such considerations I the more readily embrace the opinion of Dr. Abercrombie, that they present characters totally distinct from those of the proper tubercles, and that they have not unfrequently, by hasty observers, been mistaken for them. On the pure tuberculated disease of the peritoneum, I have little here to observe; it is, probably, an affection more real than is generally admitted, and, although we may subscribe to the opinion of the ingenious and learned Dr. Baron, that it is not the product of any species of inflammation, yet, in practice, to speak in the language of a learned author, it can signify very little whether we believe that inflammation has the power to generate tubercles in certain constitutions, or only believe that it has the power so to accelerate their progress, as to make them dangerous, and fatal within a few weeks or months, when they would otherwise have been harmless.

The symptoms of chronic inflammation of the peritoneum are the most equivocal of any affection with which I am acquainted. There is pain described to have at one time existed, but, occasionally, no such feeling can be remembered by the patient to have been at any time present. The feeling of

distention insisted on by some, is, occasionally, not complained of, and the prickling sensation spoken of by Pemberton, to be a mark, along with tightness of the abdomen, extending from ilium to ilium, are not alone to be depended upon. In the advanced stages, sometimes, the only uneasiness stated to be present, is a slight difficulty of breathing, accompanied with cough and fever of a hectic character, which I have known to mislead attentive practitioners into the supposition that the lungs were the seat of evil. That the difficulty of diagnosis is greater in this affection than in most others, may be gained by the confession of men of the first standing in the profession. Portal states *(Journal Universel des Sciences Medicales, Janvier,* 1819,) that the peritoneum may be inflamed without any symptom indicating such derangement being present, such as pain, tension, &c. He relates the case of a gentleman who, after the recession of an eruption, had inflammation of the peritoneum, with tubercles. No symptom of such affection was, at any time during his illness, discoverable. In another person who died of phthisis, the peritoneum was inflamed and covered with tubercles, yet no symptom was shewn of such disorder. A man died with decided inflammation of the peritoneum, without any affection being at all suspected, he having rheumatism of the limbs, &c. He gives a case of inflammation of the peritoneum consequent to the repulsion of shingles, in which there was no evidence of such action during life. These cases are sufficient to show the difficulty experienced even by one of the most enlightened physicians, in distinguishing cases of chronic inflammation of the bowels,

and would appear to call for more accurate diagnosis than we at present possess. Unfortunately, in this fatal affection, the disease has advanced to some state of progress before recourse has been had to medical aid, so that many of the symptoms which might, at first, have attracted attention, and led to a true knowledge of the disorder, have passed away. The slight lapse from health, in certain cases, for a long period after the commencement of the disease, and the insidious progress in all, operate as causes to lull suspicion, and the consequence not unfrequently is, that, when the patient applies for assistance, he is past relief.

Inflammation of the peritoneum, of a chronic character, pursues similar steps to the more active form in this membrane; that is, the inflammation may go on to a fatal termination, while the bowels, &c. may be but slightly affected in their functions. The action may extend to the muscular coat of the intestines, producing obstinate costiveness, or it may spread to the mucous covering, and end in ulceration of this tissue, accompanied with all the symptoms of chronic diarrhœa. I need not refer to cases in proof of these steps in the march of the disease, they abound in writers down from Lieutaud and Morgagni, to our own time. A learned and powerful writer, Dr. James Johnson, says, "it is common to confound inflammation of the peritoneum with that of the organ which it covers. We talk of isolated inflammations of the stomach, bowels, &c. as if inflammation attacked, at one and the same time, the whole of the tissues composing these organs. But it is certain that every inflammation of the viscera men-

tioned, begins in a single tissue of their structure, with corresponding symptoms, and spreads thence to other tissues, with more or less rapidity, according to the violence of disease, accompanied by phenomena indicative of the new structure successively invaded." Such being the case, under what a variety of forms, as respects symptoms, may we not expect to meet with cases of *peritonitis chronica,* in which these effects are so slowly and gradually produced, implicating, as it oftentimes does, the whole extent of membrane. If we expect to meet with the chain of symptoms laid down by Broussais, or by Pemberton and Abercrombie, in certain instances, we shall be deceived; other parts, by consent, having assumed disorder, leading the attention from the original seat of complaint, to that which must be viewed as only secondary. In the first stage of the disease, perhaps the most prominent symptoms are those of merely deranged function of the stomach and bowels, leading to the supposition of the person being affected with a form of dyspepsia. These occasionally continue without much alteration or increase, with the exception of progressive emaciation, for a long period. I lately attended a case, in which the only uneasiness complained of, was a rejection of food, daily, unattended by pain; this had been present for twelve months. On examining the naked person, it was then discovered to be wasted to the last degree, with the exception of the abdomen, which was prominent and slightly painful on pressure. The patient had taken, before I saw him, as many bitters and pills as would have furnished an apothecary's shop. Attention to external appear-

ances, in obscure cases, ought never to be lost sight of. Pressure on the bowels in the early stage of the disorder, in the greater number of cases, excites uneasiness; but when it has advanced even a small way, this is sometimes, not complained of, particularly should any effusion have taken place in the cavity; the presence of the fluid preventing the hand exciting pain, by acting as a soft cushion to the excited membrane, unless the examination be made with the patient resting on one side; in this way, from the fluid gravitating to the lower part of the abdomen, I have succeeded in discovering latent inflammation, that had before escaped observation. In most of the cases, after the disorder has been a longer or shorter time present, there is more or less of effusion, which may, oftentimes, be not very observable, the belly not being much distended: yet when the prominence of the abdomen is judged of by the relative emaciation of the person generally, it will be found larger than it would naturally be in a greatly emaciated individual.

The state of the skin, in this affection, ought to be particularly attended to, and the examination of it by no means neglected. In all cases, the want of action in the organ, even in the earliest stages, is very observable; but when the disease has been some time present, the appearance of it is remarkable, and has frequently excited my attention, in cases where, from the apparently slight variation from health, insisted on by the patient, no lurking evil was thought to exist, and which has led me to a closer examination of the case than would have been made, had the condition of the skin been more

healthy, and agreed with the apparently trivial nature of the case and the deceptive state of the patient's feelings. The skin is shrivelled, of a dull, dusky, and slightly yellowish hue, and covered with minute scurfy scales. This appearance pervades the whole of the organ, and commences early after the attack. I have generally viewed the condition of the skin in this disease, as a good premonitory sign of lurking mischief, as it is peculiarly shown in an early stage of the disorder.

There is one symptom which I have never known absent in chronic inflammation of the peritoneum, in any stage of the disease, and which is not adverted to by any writer with which I am acquainted. It is a feeling of uneasiness on descending a stair, or stepping from an elevation. Mere motion can be borne by many suffering the disease, without any sensible effect being experienced, but, in all cases, an approach to pain is, more or less, complained of, as having existed during the whole length of illness, calling for support from the hand, on descending from the room. The feeling of uneasiness, not to call it pain, excites caution in descent, but, as the progress of disease is gradual, the patient has become so accustomed to the application of the hand, or to moderation in movement, that, unless particular attention be directed to the feeling above stated, he will not mention it, or, perhaps, say that he never experienced it. A person who died of the affection once told me, that the necessity for the support, or caution, required, had come on so imperceptibly, that he thought all persons had used the same precaution. I have been told by some, that they never

experienced the feeling, and yet, on strict inquiry, I found that it had existed, unremarked. The feeling is spoken of as a sensation of dragging, which pressure on the abdomen relieves, but which is oftentimes applied without the patient being aware of it. Even the minutest sign ought to be observed, and, although the above may appear a trivial one, to those who imagine that their powers are so acute as to enable them to detect lurking disease, with half a glance, I can state, after long and close observation, that, taken in connection with other appearances and symptoms, it will be found of value as a diagnostic mark, and lead, not unfrequently, to the seat of a disease that had escaped the close and accurate observations of men well skilled in the detection of obscure abdominal affections.

In a few of the cases of chronic peritonitis, when the affection has been long present, disordered action of the lungs is, to appearance, the only prominent derangement, and the patient's observations on this complaint, lead, more or less, to the supposition of such being the fact. Dr. Abercrombie states that, in persons advanced in life, disease of the lungs is, occasionally, present, and the dissections to be met with in various authors, of lesion in this organ, prove the truth of the observation. Yet, in not a few of the cases, the difficulty of breathing, cough, &c. originate not from any particular disorganization of the lungs themselves, but from effusion of serum thrown out by the pleura; as tissues of a similar texture, not unfrequently partake, more or less, of the disorder in a neighbouring one. Thus we find the nervous membranes of the brain, are affected in the

same way, sometimes, in protracted cases of chronic peritonitis. The healthy or diseased condition of the lungs, can be readily ascertained by the stethoscope, and if there were not another proof of the benefit derived by this discovery of the immortal Laennec, than that which is gained by it even in the affection under consideration, it had deserved well of society. In this affection, it enables the practitioner to trace out the normal condition of the lungs, and to seek, in other organs, for the primary cause of the disease, which is sapping, slowly yet certainly, his patient's life. I have witnessed the advantages of a strict stethoscopic examination of the lungs in peritoneal inflammation, when the person was said to be in a confirmed consumption, but where no disease, farther than partial effusion, was discovered, and the patient recovered. Dr. Armstrong says, in "estimating the character and seat of chronic diseases in general of the vital parts, it is of consequence to ascertain what symptoms are stationary and what temporary; for the temporary symptoms only mark a tendency to disordered action, from some sympathetic or incidental cause; whereas the stationary symptoms indicate positive and progressive disease, and, on this account, ought to claim the special care of the medical attendant." To this opinion we are bound to subscribe, and in investigating the progress of chronic inflammation of the peritoneum, it will be found of the greatest value.

In the treatment of this fatal affection, little can be gained from the older authors. Morgagni, who entertained better notions of the nature of the disease than any that had preceded him, or that immediately

followed him, recommended leeches to the anus, with gentle laxatives and mild diet. The common treatment consisted, generally, of anti-spasmodics, laxatives, &c. many viewing the complaint as a species of cholic * Hoffman's plan was more varied, but yet not more successful than that of others, and the *colicæ diuturnæ,* notwithstanding all efforts, generally ended in death. Till Pemberton's time, no systematic plan was pursued, that was at all productive of benefit. This latter, in the early stage, doubtless, has proved useful, yet, in the more advanced state of the disease, it is a question whether the method possesses any thing in it superior to what had been resorted to before. That neither local nor general bleeding, with laxatives and rest, nor blisters and mild diet, with the abstraction of spirits and animal food, will cure the disease in an advanced stage, is as certain as any other truth. He who has had an opportunity of seeing the disease treated in the Val-de-grace, must be aware that the free application of leeches to the abdomen, with tisane, &c. cannot be depended upon, and that if he hopes to cure the disorder, he must resort to other means. Dr. Abercrombie has so little faith in any treatment when "the disease has advanced but a little way in its progress;" that he looks upon it as irremediable. My experience in the treatment of the affection, I am happy to state, is decidedly opposed to such an opinion, as the sequel will display.

* Vide a learned article by my friend, the celebrated Dr. Copland, on Chronic Inflammation of the Peritoneum, in the Medical Repository, 1821.

In the year 1820, my attention was first directed to the use of mercury in a more active manner than I had been employing it. The mode generally adopted, of giving it in an alterative form, I had long been satisfied, was as futile a proceeding as the simplest practice could possibly be; I therefore determined to try the remedy, so as to produce a sensible action by it, rather than continue a method by which no operation, in any way, appeared to be effected. The first trial convinced me that mercury was only beneficial when given in doses sufficient to excite the system, and that, if given in any other way it had no power. I was the more supported in the opinion, by farther witnessing its effect and harmlessness. Dr. Robert Hamilton had, long ago, recommended this drug, in inflammation of an active character in other organs, but how it was that the remedy had not been employed in inflammation of the peritoneum, of a less acute nature, I could not learn, and my reading did not inform me whether mercury had ever been resorted to in chronic inflammation of the peritoneum. However, I proceeded with it cautiously, and after long and repeated trials, I am convinced that we possess no remedy, in chronic inflammation of the peritoneum, that can be depended upon, but mercury, and that it may be employed in all stages of the disorder with the greatest safety, in states of the greatest debility, as well as in conditions of greater strength. I was not ignorant that the medicine had been given in all forms of inflammation of the liver, &c. chronic inflammation of the pleura, and even carried to salivation, but I had no proof of its success or safety

in the diseased state of the peritoneum from low inflammation, nor am I even now acquainted with any writer that has recommended it, particularly, in this affection, except Vandenzande, in a treatise on its use in certain conditions of puerperal disease, and Meridec Laennec, in the Revue Medicale, May, 1824-5. The work of the former I have not seen; the latter states he took the idea from Vandenzande. As to priority of use, I may certainly claim it before either of them, as I can prove by a reference to cases, and more particularly to Mr. Dawson, surgeon, of this place, who has witnessed its employment by me from the commencement; but I take little credit (if I were able to prove having first employed the remedy,) in being the recommender of it, further than in being able to speak of its benefit in this awful disease. That mercury has, however, not been employed extensively in chronic inflammation of the peritoneum, or recommended by those who have written more particularly on the disease, may be learned by referring to the writings of Pemberton, Copland, and Abercrombie, none of them even alluding to its employment; the first of these, in the latest edition of his work on Diseases of the abdominal viscera, makes no mention of it either in his observations or in the cases which he gives us; nor does he appear ever to have used it in this fatal complaint. Dr. Armstrong only speaks of it to deprecate its active use; he says, "mild courses of mercurials have seemed to me far more beneficial than long or severe ones in chronic inflammations." He is alluding more particularly to chronic disease, accompanied with obstruction in the liver.

Respecting the exhibition of mercury in an active manner, in the very advanced stage of this disease, I can only say that I have given it in all stages, in which the greatest debility existed, and pushed it on to salivation with success, when it was supposed that extensive disorganization of all the viscera prevailed. After all inflammatory action has been subdued, iodine, in small doses, as recommended by Dr. Baron, for the reduction of tubercles, to remove morbid growths, has been frequently given, with effect. It is a question whether the products of inflammation, such as adhesions, &c. operate so injuriously after the disordered action which caused them is removed. Dr. Baillie believes that the "membrane is capable of elongating, gradually, by the motion of the viscera upon themselves, so as ultimately to be attended, in general, with very little inconvenience." Soon after the mercury begins to operate, the effusion in the abdomen, generally present in the disease, is rapidly absorbed.

In some cases, every effort to introduce the mercury into the system, proves abortive; these are, invariably, fatal cases, and are, I suspect, mostly accompanied with extensive ulceration and disorganization.

The mode of exhibiting the mercury when resorted to, has, generally, been in form of pill, with inunction of the blue ointment on the thighs or abdomen. I have added to the latter, a little of the tartar emetic ointment, as recommended by Dr. Copland, with the hope of the mercury sooner being absorbed. Ten grains of the blue pill, night and morning, with mercurial inunction two or three times a day, have

mostly been prescribed, and persevered in until the mouth has been made sore. The healthy action of the skin, too, is an object not to be lost sight of. During the employment of the medicine, the skin is to be daily rubbed with a cloth damped with vinegar and water, warmed, and afterwards dried with a rough towel, to excite action in the organ. The advantages gained by this practice, will be shewn in the sequel, and, although to a few, the quick introduction of mercury into a system hitherto so far reduced, may appear a dangerous proceeding, yet I can state I have not found it so; and facts are before preconceived theory, however ingeniously and learnedly it may be supported. M. Laennec's confidence in the remedy is most unbounded, and he speaks, in some parts of his reports, in enthusiastic terms, of the benefit, both sudden and complete, derived by its use, "*Dans les quartre cas indiqués le traitement a éte tres efficace, et dès les premiers signes de salivation, les symptomes de peritonite ont constamment disparus.*"

Case 1.—In December, 1820, I was requested to visit a woman, aged about 45, who was stated to have been in a declining condition of health, for a long period. I found her complaining of great weakness, with cough, and partial difficulty of breathing. She had some pain, occasionally, in the bowels, with slight sickness and occasional diarrhœa. Her pulse was quicker than natural; she had a parched mouth, white tongue, and entire loss of appetite. She had been gradually getting worse for some time, and, latterly, her strength had become much reduced. Her sleep had gone. She dated her disorder to have

commenced early in the spring. From the beginning, motion had affected her, and excited more or less of unpleasant feeling in the abdomen. On examining the latter, it was found a good deal distended, and, on pressure sideways, pain was produced. She was extremely emaciated. The skin was shrivelled and unhealthy in appearance. The cough was unaccompanied by any expectoration, and the breathing was only quickened on exertion. Ten grains of blue pill were ordered to be taken each night, and each thigh to have a portion of blue ointment rubbed into it twice a day. In a fortnight's time her mouth became very sore; from this time her health returned, and, in two months, she was perfectly well, with the exception of slight œdema in her feet. The abdomen had quite fallen. The catamenia had not been regular for a considerable time prior to the decline from health. In this case the action of the remedy was shown in a remarkable manner, and, although the return to health was less rapid than in the other cases, the recovery was more than was expected. The mercury was rather slowly introduced, from a fear of doing injury.

Case II.—A young girl, æt. 18, who had never menstruated, began to decline from health in the spring of the year 1821. She went on during the summer, alternating between health and disease, till I saw her in September. Her affection was supposed to arise from the want of a natural discharge. Her symptoms were occasional pain, and some distention in the bowels, with irregularity in their action. Her stomach was irritable, and would retain little but simple slops in small quantity. The pulse was rapid;

tongue white, and covered with a thick fur in the centre; great thirst at night, which was passed, generally, without sleep. She was much emaciated, and had a pale sallow countenance. The skin was covered with scurf, and hung in folds loose and shrivelled. Motion produced uneasiness, which was increased on descending the stairs. On closely examining the abdomen, it was found enlarged, and was, more or less painful on pressure; she could not bear her stays tightened, as this increased the uneasiness. She had, now and then, early in the attack, severe pain in the abdomen, but now the pain was rather a griping, which was increased on taking any thing hot. She was, according to the account given of her, "worsening fast," as she could hardly walk; the weakness had rapidly increased during the last month. She had no cough or quick breathing, except on going up stairs. Her water was scanty and high coloured. She was directed five grains of blue pill at night, and the thighs to be rubbed daily with blue ointment. In ten days her mouth was sore, and as the remedies were persevered in, it, in a few days more, became excessively so. She, however, began to amend, and, in a month, was nearly free from disease, except weakness and emaciation, of which she was getting better when she left the town. I have understood she died at a distance from this place, of some obscure disorder, four or five years since. She enjoyed moderate health till within a year of her death.

Case III.—Mrs. M. æt. 39, mother of several children, in the winter of 1823-4, began to suffer from disorder in the stomach and a confined state of

the bowels, accompanied with rapid emaciation and loss of milk, in consequence of which she was obliged to wean a child of a few months old. I saw her in June, and considered her case merely as one of dyspepsia, and directed her to take a tonic and aperient, and to live on solid diet. Under this plan she recovered a little, and I saw not much of her till October. She was then much altered in appearance. Her complexion was gone, and she was emaciated to a skeleton. The state of her health determined me to give her case a more full investigation, which I thought I had before ascertained by a mere glance at it; but things now had assumed a serious shape, and I saw that without something was done, I should lose my patient. The case was an obscure one, and I set myself to it with a feeling of distrust. She was complaining of a constant disposition to sickness, with more or less of vomiting. After each rejection there was pain, and a feeling of distention, as if the stomach, although lately emptied, was yet full. On examining the stomach, (there being no complaint made of the bowels, in any way, I scarcely thought of them,) I found it swelled, and slightly painful, on pressure; on carrying my hand down, I found the enlargement extended over the whole of the abdomen, yet without any feeling of pain on deep pressure. She never had complained of pain in the bowels of any kind, and, with the exception of costiveness, they, to appearance, were little in fault. On questioning her particularly, however, she acknowledged that nearly from the beginning of her illness there was a feeling of unpleasant dragging in the bowels, which, when she stepped suddenly off a chair or any

eminence, obliged her to seek support from the hand, which she never thought of until now questioned. I learnt she had fever at night, too, on farther questioning her, and a white and dry tongue. The pulse was always quick; the motions unnaturally dark and mixed; the urine scanty and deep coloured. The skin was covered with small scales, and was arid and unnatural in hue. Every part of the viscera seemed implicated, and yet there was no great pain or uneasiness in any. The disease was, what was not at first suspected, chronic peritonitis in a masked form. She was rapidly put on a course of mercury till ptyalism was freely produced, and she as rapidly recovered, and is living at this time. This was a very obscure case, and was, at first, set down by me as a case of dyspepsia, in one or other of the forms detailed by Dr. Philip or Dr. Johnson, and she was treated, under such supposition, by various remedies not necessary to be here mentioned. But the distention of the abdomen, the constant fever, the state of the skin, with pain or uneasiness on walking down stairs, along with the gradual and progressive emaciation, all proved that the affection arose from another cause rather than from functional derangement, and she was treated accordingly.

Case iv.—On July 10, 1828, I was desired to see a young lady who was supposed to be in an advanced stage of pulmonary consumption. She had been seen by two or three medical gentlemen, and had been last attended by a gentleman in Liverpool, of great eminence, who had directed her digitalis and an expectorant draught daily, with change of air. The chest being supposed the seat of disorder, I first

directed my attention to that, and, with care, explored the whole of the chest, leaving not a part unexamined by the stethoscope. I was unable to discover the slightest sign of disorganization in any part of the lungs, and, with the exception of some effusion in the lower part of the chest, they appeared in a normal condition. The symptoms were, short dry cough, considerable difficulty of breathing on motion, and hectic fever at night. There was, and had been, from the first, considerable derangement of the stomach, such as total loss of appetite, occasional vomiting of acid matter, with considerable distention of the stomach and bowels, supposed to arise from air. The first appearance of disorder occurred early in the winter, after partial exposure to cold; at first there was more of pain present in the bowels, occurring at intervals, but this, after a time, became less frequent, and now was not complained of at all. The derangement in the chest commenced after the affection in her general health had been some time present, and the cough, &c. became so troublesome, as to attract the whole of her attention. On examining the abdomen, it was found enlarged irregularly; deep-seated pain was excited by firm pressure in all parts of it, and the integuments appeared as if stretched over a board, the muscles of the belly being much contracted. The skin was scurfy and hung in folds, she being very emaciated. It was dry and never perspired. There had been more or less of fever present from the first, and the pulse was, at this visit, nearly 100. There was, all along, a deep-seated pain, excited by motion, and she found it necessary frequently to apply the hands to the

bowels, when she descended from her room. The feet were œdematous to a great degree. There was thirst with white tongue ; difficulty in making water, which was high-coloured, and considerable irregularity in the bowels, which were, sometimes, rather too open, but more frequently confined ; the motions were mixed with matter of different colours and consistence. The symptoms, taken collectively, proved that the seat of mischief was not in the chest, but in the abdomen, and that the affection was chronic inflammation, which was rapidly hastening her to the grave. Blue pill was ordered twice a day ; the abdomen was directed to be rubbed, thrice a day, with a liniment of camphor and mercurial ointment, and the skin was directed to be daily washed with warm vinegar and water, followed by friction. Milk diet was allowed, with mild drinks, and no stimulants. The mouth was not affected for three weeks, although mercury was given freely ; at the end of this time, it became very sore ; in another week free ptyalism was produced, and in a month she was perfectly well, having a good appetite, and improving in strength. The only grievance being the remaining soreness of the mouth. In another month she returned home, quite well, and continued so for a twelvemonth, when she found slight sickness coming on, with loss of appetite, which alarmed her so much, as to induce her to visit Whitehaven again. It was a false alarm. She returned home, a distance of above one hundred miles, and is, at this time, in a perfect state of health.

This case is one in which the lesser evil swallowed up the greater, so as to deceive even those who were

in the daily habit of investigating disease in all its shapes. Had the stethoscope been used early, it would have told a different tale to that of the patient or her more distressing symptoms, and would have probably induced a farther investigation as to the cause of the complaint, and led, perhaps, to a better treatment.

I give a short account of the following case, merely to shew that simulated disorder of the lungs is not uncommon in chronic inflammation.

Case v.—On June 1, 1828, I was requested to see Miss M. who had, a few days before, arrived from Liverpool. She had been ill, for eight months, with an affection of the chest and disordered stomach. On enquiring into the history of the disorder, I found that the first lapse from health was shown by derangement in the stomach and bowels, attended with occasional pain and vomiting. She had some cough and quick breathing, but no expectoration, with hectic fever, unaccompanied with perspiration. The stethoscope did not show any lesion of the lungs, which led me to seek for another cause for the emaciation and failure of strength. On strict enquiry, I discovered that she traced her complaint to cold, that it began by symptoms of disordered condition of the first passages, she having pain in her bowels with irregularity in their action, and that the diseased action in the lungs followed the complaint in the stomach, &c. The abdomen was fuller than it ought to be in one so emaciated, and pressure excited pain in every part of it. The griping which once had distressed her, had latterly much abated. The integuments covering the bowels, were as if

they were attached to a hard body below. Motion had, all along, excited an unpleasant feeling, and caution was obliged to be used on stepping into the street or down stairs. The pulse was rapid ; tongue white and the urine scanty. The skin was without action, rough and scaly, and of a dusky hue. The feet were slightly œdematous. Sleep had left her for a long period. It was as decidedly a case of chronic peritonitis as any it had been my fortune to see, and I told her it would be necessary to put her on a full course of mercury, and instanced several cases that had got well, although much farther advanced in the disease than she appeared to be. To this she objected, observing that her medical attendant had told her, that change of air was all that could be done, and that this was alone necessary. I asked her what she had sent for me to do ; she answered, merely to relieve her cough. I saw her no more. She retired far into the country, but received no benefit, and in a short time returned to Liverpool, where she died, as I learned from a relation a few months after.

Case vi.—In March, 1827, I was desired to visit Mrs. H. an elderly lady, who had been, for some time, declining in health, I found her complaining of a number of anomalous symptoms, such as irregularity in the bowels, with occasional vomiting of acid fluid. She had quick pulse, with dry and white tongue ; slight pain, occasionally, in the abdomen, with a distressing feeling of fulness in the stomach, after being sick. On examining the bowels, I found them a good deal distended, and, when lying on the side, pain, on pressure, was produced. She was

much emaciated, and had, for some time, entirely lost all appetite. Motion was distressing to her, as she was obliged to support the bowels with her hands on going down from her chamber. In the centre of the bowels I found an enlargement, the size of a goose egg, or larger, which she stated to have been present for thirty-five years, without exciting any uneasiness. It was, probably, a fatty enlargement of the omentum, and had been entirely free from pain, on being handled, until lately, when moving it gave her pain. She had been to Moffat and Buxton, without receiving benefit. I directed her mercury, both internally and externally, until her mouth was sore, and she left this place nearly well. She is now in perfect health, at least was so when I last heard of her, which is not long since.

Whether we are to view this case as at all having its origin in the presence of the tumour, is doubtful; I merely state this, as it was the opinion of one who saw her. That the sole cause of all her symptoms originated in latent inflammation, I have not the slightest doubt. She had been treated, for a long period, on the principle of functional derangement, by several practitioners, without any relief, and she was declining fast when mercury stayed the progress of the mischief, and she got quickly well.

Case vii.—A female, about 40 years of age, consulted me on May the 1st, 1829. She had been disordered in health for many months, and had received benefit, at one period, by a removal to a sulphur spring, about thirty miles from this place, but the benefit was only temporary. She stated that her complaint began first in her stomach, and then her bowels

became disordered, occasionally laxed, and, at other times, confined. At first the griping in her bowels was slight, but latterly it had become very severe, accompanied with a painful desire to micturate. The pain extended over the whole of the abdomen. She had slight fever, with a quickened pulse, and white tongue. The abdomen was a great deal distended, and she could not move without much pain in the lower part of the bowels being excited. Her strength was wasting, and from a stout and plump person, she had become emaciated. Pressure on certain parts of the bowels could be borne, but in others, pain was produced. She had been taking, before I saw her, anti-spasmodics and laxatives, but was getting worse. The nature of the case was evident. Leeches were directed to the abdomen, and ointment, formed of ung. hydrarg. fort and ung. antim. tart. Calomel with opium was ordered to be given, so as to produce its effect, which, as soon as this was shown, was almost immediately followed by a remission of symptoms, and, in no long time, she was suffering from nothing but soreness of the mouth. She, at present, enjoys the best health.

This case of chronic inflammation, in a more active form, had been going on, from mildness to severity, for the space of eighteen months, and would, there is small doubt, have ended as cases of the kind commonly do, in death, had not mercury arrested the progress of the disease. The recovery was rapid.

Case viii.—In the early part of April last, I saw a young gentleman who had been, more or less, disordered in his stomach for six months, with slight griping in his bowels, which, he told me, had been

gradually becoming more distressing to him. During the whole of the winter, he had daily vomited his dinner, or whatever food he had taken of a solid nature. He was now getting emaciated and weak, and the affection of the bowels was increasing. His pulse was always rapid, and he had furred tongue and great thirst. The abdomen was larger than natural, and, on firm pressure being made, pain was produced. It was so hard and unyielding to the hand, that none of the viscera could be examined. Walking down stairs, or a hill, affected him, and he was obliged to support himself with his hands. He felt difficulty in standing upright, and stooped considerably, to afford relief to the pain, which was always increased on stretching himself. After rather a prolonged course of mercury, owing to the difficulty of getting the medicine to produce its action on the mouth, he gradually returned to health, and, at present, is perfectly well, having lost all his dyspeptic symptoms, for which he had been drugged for a long period.

This case was remarkable, from the extreme difficulty of getting the remedy to act. It was diligently persevered in for a month or six weeks before free action could be excited; but when once the mouth became affected, he quickly recovered, and removal to the country, for a time, restored him to better health than he had ever enjoyed.

Case ix.— I was desired to see Miss —, who had been affected with derangement in the bowels, &c. for three or four months. Her symptoms were those of masked peritoneal inflammation. She had been taking, for a time before I saw her, a variety of re-

medies to strengthen the apparently weakened organs; and alteratives with purgatives. I recommended the free employment of mercury, but, from some cause, its effect was never displayed, and, after a short time, an affection of the brain showed itself, evidenced by great pain and intolerance to light, which continued for a brief period, and ended in blindness and death, notwithstanding every means to avert the threatened danger

This case is one, among two or three others, that I might bring forward, to show that affections of the brain occasionally follow derangement of the first passages, and, particularly, chronic inflammation. Had the remedy been given with the firm intent to produce its action, the patient might have probably been saved.

In the case of a pupil of my own, the mercury could never be made to produce any action in the system, although pursued with the greatest vigour. When this is the case, the disease pursues its march unchecked, and death, in a longer or shorter time, closes the scene.

I have thus presented to the society a variety of cases, in proof of the peculiar effect of mercury in an affection allowed to be of the most dangerous character. The cases have been selected from amongst a great number, to elucidate particular views advanced in the remarks. That there is no remedy yet known equal to mercury, in the cure of this disease, I think must be admitted, and as it may be employed in all stages of the affection, without the slightest danger, it is one deserving of farther confidence than it has yet received. Respecting

the exhibition of mercury, I can state, from the extensive employment of it, that I have never witnessed any affection of the bones, &c. produced by it, unless the system had been affected with the venereal disease previously, and I cannot resist, in this place, offering the meed of praise to Dr. Musgrave, for being the promulgator of so valuable a fact.

THE HISTORY OF A CASE

OF

LITHOTOMY BY THE RECTUM.

BY JAMES DAWSON,

Surgeon to the Liverpool Infirmary and General Hospital.

Robert Cox, nearly three years and a half old, of diminutive form and sickly aspect, was admitted into the Liverpool Infirmary in January, 1832.

The history of this child's sufferings, during the past six months, was detailed by his father, and it was sufficiently distressing to lead to the belief of the presence of a stone in the bladder. After a few days of repose, the sound was passed, but no calculus could then be detected. The urethra was found to be short and very narrow, admitting, with difficulty, the smallest instrument. The bony outlet of the pelvis was deformed; the space left between the conjoined pubic and ischiadic branches being narrowed to a degree I had never before witnessed; this space, by admeasurement, not exceeding one-third of an inch; the course of these branches, to within one quarter of an inch in front of the anus, was nearly parallel; from this point into the tuberosities, their divergence was abrupt, leaving ample space for the anus itself.

Rigors, nausea, and complete prostration of strength, were the immediate result of this search, as,

indeed, they were of every subsequent one. It is scarcely requisite to state, that these examinations were invariably conducted with all due care and gentleness, or that sufficiently protracted intervals of repose were always allowed for the purpose.

On account of the extreme irritability of this child, the utmost possible tenderness and tact were required on the part of those who had the immediate superintendence of him: in this respect he was especially fortunate, for, to the untiring kindness and watchfulness of his nurse, his recovery may be mainly attributed.

The act of passing his urine was succeeded by a state of weakness bordering on syncope; by the eversion of the lining membrane of the rectum, and by the escape of its contents.

After remaining in the infirmary for a few weeks, during which period the search for a foreign body was renewed, but in vain, he was sent home to his parents, in the hope that, by their soothing attentions, his general health, which was by no means in a satisfactory state, might be improved, and in the expectation, also, that a little further delay might unfold, and thence enable me to detect, some tangible, or, at least, some intelligible, cause for his hitherto unmitigated sufferings. On his return, however, in five months afterwards, he was in no respect improved.

His mother had entirely neglected him; she had allowed the anus to remain in a state of prolapse nearly all this time, so that the exposed mucous membrane had acquired a deep purple tint, was beset with excoriations and ulcerations, and presented, altogether, a very menacing appearance.

Some pause was necessary, in order to bring the part into a condition to bear any future exploration.

Taking advantage of a tranquil state of the rectum, I passed the finger, when its point was abruptly met, about half an inch within (or beyond) the fibres of the sphincter ani, by a bulging downwards, in a pouch-like form, of the upper wall of the rectum, through which membrane could be felt, but not very distinctly, the outline of a solid, and hence, probably, a foreign body, of about the size of a large Spanish olive, which appeared to be firmly seated in its novel situation.

The bladder was forthwith sounded, when the instrument struck against a stone. The foreign body sustained by, and felt through, the medium of the anterior wall of the rectum, was hence satisfactorily identified with the calculus just detected in the bladder. Here, then, was an instance of sacculated stone. It is useless to enquire whether the pouch was a congenital, or an accidental, formation. One thing seemed to be certain, viz. that owing to the extreme narrowness of the bony outlet, the calculus was inaccessible by the usual lateral operation ; indeed, I feared, at one time, it might be so by any other route.

By the division, in a semi-lunar form, of the structures lying in front of the anus, that is, with the concavity of the incision looking downwards, and by a corresponding bi-lateral section of the imperfectly formed and compressed prostate gland, I might be enabled to approach the stone, but it would be almost impossible to extract it, without inflicting a degree of injury on that gland, and on its important

connexions, that appeared to me to be unwarrantable. And then, with the division upwards, (according to M. Sanson's method.) of the fibres of the sphincter ani, of a portion of the anterior wall of the rectum, of the prostate gland, and of the neck of the bladder itself, I feared there must be associated the hazard, not only of forming a permanent communication between the bladder and the rectum, but also that of a loss of power in the sphincter ani, and, lastly, of dangerous infiltration of urine.

My object was, of course, to get at, and to remove, the stone, with the least possible sacrifice of structure and of function. Owing to the boldly pronounced *rectal* aspect of the sac, the calculus was placed in a position at once accessible and easy of extraction, and this comparatively favourable posture of affairs was not long overlooked.

It was manifest that, in approaching the concretion by this route, nothing need be divided but the anterior wall of the rectum, along with the lower fundus of the bladder lying in contact with it : the division of these investments might be made exactly in the median line, and to a limited extent, so as to leave, untouched, the sphincter ani in front ; the undeveloped vesiculæ, and the terminations of the vasa deferentia on each side ; and, I did venture to hope, the important fold of the peritoneum, should it also happen to form a part of the posterior face of the sac. The misery resulting from the establishment of a permanent communication between the two outlets, seemed, in every way, unavoidable. But the grave anatomical objection remained, viz. how near to the base of the prostate gland, might the reflected fold

of the peritoneum advance? Since, on the possibility, or otherwise, of its avoidance, the safety or danger of my patient depended.

My colleagues, indeed, with their wonted kindness, endeavoured to assure me that my apprehensions of danger, from this quarter, would prove to be groundless; it was a possible contingency, certainly, that, in the event of this important fold of the peritoneum being dragged down so far as to be implicated in the formation of the posterior boundary wall of the sac, still all communication with the abdominal cavity might be closed, by the adhesion of its contiguous surfaces; or by the interposition of plastic lymph, so that, should its division be unavoidable, the danger of opening a way into the serous membrane might not be the result: and, lastly, I was repeatedly reminded, that children bear these things wonderfully well. I determined, therefore, to operate, whenever he should be brought into a state of health that would justify such a procedure: his present weak and irritable condition, however, forbade any immediate operative measures.

The agony he suffered in passing his urine, was estimated by the cold sweat, and by the paleness of countenance that always accompanied this act, which might be termed the "paroxysm of expulsion." He was not very likely to recover his health under these distressing circumstances, and every form of narcotic remedy, was unsparingly, but unavailingly, administered. At length, a very simple expedient was found to answer, viz. the introduction, at stated intervals, of an elastic-gum-catheter, which had been prepared so as to retain a permanent curve, without

the wire, and which was always thus used. His nurse became so expert in the employment of the instrument, that no other aid was ever required. From this moment pain and spasm ceased, as far as the expulsion of urine was concerned, and they never afterwards returned.

My attention was now directed to prepare the rectum for the presence of a new and exasperating secretion; which was likely to be a work of time and of difficulty. I did not apprehend any serious inconvenience would result from the re-flux of the urine, along with the fæces, into the bladder.

Every variety of astringent, and of sedative injection, was used, but each was abandoned, in its turn, as worse than useless. At last the injection of cold water alone was found to fulfil every indication; it appeared to soothe the mucous membrane better than any thing else. Twice every twenty-four hours the rectum was filled with it, and the decided comfort the child experienced, was very soon made evident in his improved appearance. The bowel, in losing its irritability, entirely recovered its healthful tone and function, and among other beneficial results, he got rid of a chronic diarrhœa, to which he had been liable.

In the space of a few months he had become stout, florid, and cheerful, and was, in fact, in more robust health than he had ever before been. Weeks and months were allowed thus to pass away, the child seeming to be too happy to be disturbed, and I was in no haste to interfere with the comforts he was now enjoying. Indeed, could the same degree of attention have been afforded him in all future time, the

question might have arisen, whether any operation at all was justifiable? But of this there was no chance, and the operation was undertaken in January, 1833.

The operation.—He was bound by no ligatures. The nurse supported him on a pillow on her lap, in the usual position. A gum-lancet, having its anterior edge rounded and very keen, was laid flat on the finger, which, thus armed, and oiled, was introduced through the anus, so as to reach a point a short distance beyond the recto-vesical pouch, when its edge was turned upwards, and a decided cut made, by drawing the instrument from behind, forwards, in the median line, through the walls of the pouch, and up to the stone, on the hard surface of which, the edge of the lancet was distinctly felt to grate.

I may mention, that the back part of the blade of the instrument was blunted, which allowed the point of the finger to project beyond it, and which was thus at liberty to direct, as well as to execute, the intended incision. After pausing a few moments, to allow time for the retraction of the divided structures, the finger was again passed, when the calculus was felt to be entangled among a mesh of elastic fibres; hence a second section became necessary, in effecting which, the speculum was employed.*

The calculus was now found seated in the upper, or vesical, region of the sac, whence, having been displaced by the finger, it fell into the rectum, from

* The employment of this instrument was productive of great torture to the child, and as the degree of stretching to which the mucous membrane was exposed by its presence, was undesirable in every point of view, it was instantly withdrawn.

among the valvular folds of which, after eluding the attempt once or twice, it was finally withdrawn by the help of Pellier's double silver wire, which served the purpose of scoop and lever. No blood was lost. The operation lasted nearly five minutes.

The calculus was found to be much smaller than we had been led to expect. I have omitted to state that, during the operation, a quantity of hardened or dried mucous escaped, along with the fæces, through the sphincter ani; it resembled, in form, the peeled skin of a small apple, and it struck us, at the moment, that this substance might have been coiled round the lower moiety of the concretion, something after the manner of the cup of the acorn, and might, in this way, have added to its apparent magnitude.

The child passed two liquid stools on the day of the operation, in each of which a clot of blood was found, equal, in quantity, to about two drachms. He passed a very tranquil night. During the four succeeding days, the evacuations from the rectum were chiefly made up of urine. About this period of the after treatment, "Clot Bey" visited our infirmary; he expressed great interest about the child, but he gave me no hope whatever of the ultimate closure of the communication between the two outlets. A very slight degree of tenderness was detected, on pressure, at the lower part of the abdomen, on the second day after the operation, but this was very promptly and properly treated by the house surgeon, Mr. Simon, and no more was heard of it afterwards. On each succeeding day, two liquid motions were passed, the urinous admixture being

always perceptible in them; the anus, however, remained free from the slightest appearance of excoriation.

And now was experienced the benefit of the sphincter ani. The control exercised by the fibres of that muscle, kept him clean and dry. It was only when the desire to empty the bowel came on with too much suddeness and urgency, to allow time for the bed-pan to be placed under him, that his bed-clothes or body-linen were at all stained by the excretions.

On the tenth day from that of the operation, to my surprise and delight, I found he had passed his urine, to the amount of four ounces, in a full stream through the penis; it was voided without pain, or straining, or spasm. After this, no urine was ever detected in the evacuations.

The calculus, (see below) twenty-four hours after extraction, and spontaneously dried, weighed just sixty grains. A few particles had been separated in the operation. It consisted, externally, of ammoniaco-magnesian-phosphate. The internal part, where seen, consisted of phosphate of lime.

With a view to testify the integrity of his cure; to allow my professional brethren an opportunity of seeing him; and, lastly, to save him from the neglect and the miseries of home, he was allowed to remain in the infirmary nearly six months longer.

In all this time he never had a complaint, except an occasional attack of the diarrhœa, to which he had been liable before the operation, and which now, as formerly, was always brought on, after exposure, in the slightest degree, to cold, or by the slightest error in diet. He never regained the florid complexion he had before the operation.

He left the infirmary in July, and I regret, exceedingly, that he happened to do so at that juncture, for, in a few days afterwards, he fell a victim, along with his father and sister, (all within twenty-four hours,) to the pestilential cholera.

Liverpool, Nov. 1833.

CASE OF HYDROPHOBIA.

BY RALPH BARNES GRINDROD, ESQ.

Surgeon, Manchester.

(WITH A PLATE.)

I PROPOSE to give, in this communication, a plain statement of a distressing and fatal case of Hydrophobia, in the form in which I have, during its progress, noted down the particulars in my Journal. I have abstained from offering any speculations which have suggested themselves, because our present knowledge of the nature of this complaint, appears to me to be too imperfect and deficient to serve as the basis of a satisfactory theory; and because I have generally observed that, in such cases as this, fictions of the fancy are at variance with legitimate deductions from facts.

Thomas Pitt, æt. $6\frac{1}{2}$, was, on the morning of Monday, Dec. the 2nd, 1833, bitten over the left eye by a rabid dog. The parents of the boy immediately washed the wounds, and took him to a public institution, where, however, no decisive measures were pursued. No further notice was taken of the boy until, upon hearing of the circumstance, I called upon the parents on the ensuing Wednesday, and, with their consent, excised the parts, and afterwards applied a strong solution of caustic. The boy called

at my house frequently afterwards, in order to have the excised parts dressed. They soon healed.

On the morning of Wednesday, January the 8th, the boy appeared in his usual health playing with his associates. About two o'clock in the afternoon, he attempted to drink some water, but, on elevating the vessel to his mouth, he trembled, and declared he could not drink any. This circumstance did not excite the suspicion of his parents, who attributed it to the effects of the cold water on the teeth.

About half-past nine, P. M. they observed him again to fail in the attempt to drink some water; he seemed much agitated, and, in an anxious tone, cried "I can't, I can't drink it." He made several attempts, at his mother's request, but in vain, each attempt being evidently attended with uneasiness and alarm. His mother then prepared to wash him previously to his retiring to bed, but on approaching the bowl containing the water, he turned from it in a hasty and frightened manner, and begged of his mother not to do so, as he could not bear the approach of the water. They now began to fear lest the symptoms were consequent on the bite of the dog, and immediately requested my attendance. The mother afterwards said that, during her husband's absence, the boy started in so violent a manner, as to oblige her to place him on a neighbour's knee.

On my arrival I found him on the man's knee, quiet and apparently dosing. His features appeared flushed and rather anxious. I spoke to him kindly, and requested him to drink a little water, accompanying my request with a promise of a reward. He replied, "no, I can't," several times;

but, on further solicitation, he consented to try, although with evident reluctance. He took the cup containing the water, but, on raising it to his mouth, it produced much excitement and alarm, and he put it from him with eagerness, repeating his former declaration of not being able to drink any. This he did, several times, in a resolute manner, and the same result followed. On my blowing suddenly on his face, he started back alarmed, and expressed great uneasiness and pain, requesting that I would not do so again. He complained of soreness in his throat, and, at times, his voice was rather husky. His pulse was very quick, and the skin dry and hot. He passed his urine as usual.

He remained quiet upon the man's knee, except when disturbed by slight spasmodic action of the pharynx, and as he appeared inclined to sleep, I did not attempt to disturb him. He breathed quickly whilst in this situation, and when the pharyngeal spasms came on, he expressed his uneasiness by a slight cry. After he had remained in this situation for two or three hours, I again offered him some water, which he refused, but consented to take a little warm tea. The tea, however, produced the same effects as the water; but on trying to take some by means of a spoon, he swallowed a few drops, and on being encouraged to persevere, the deglutition became less difficult, until he had swallowed more than half a teacup full.

Having no doubt as to the nature of the disease, I recommended the application of a blister to the back of the neck, with the intention of applying the acetate of morphia to the abraded surface. I then

attempted to put him into a warm bath, but, on placing one of his legs into the water, the general trembling and convulsive spasms came on, and prevented me from proceeding with the trial. He allowed his mother, however, to wash both legs, but exhibited, during the whole time, great aversion to the water. He now requested to be put to bed, and as he appeared inclined to sleep, was left alone. In a few minutes he shouted loudly, in a state of alarm at being left alone, and asked his father to come and lie by his side. He remained in bed about two hours, and seemed rather more composed, but breathed quickly. The symptoms did not appear to increase.

January the 9th, quarter to 10, A. M.—The same symptoms as I have before described. The sensibility seemed to be rather increased, as the spasmodic action was excited, by the mere mention of water. He complained of pain in the forehead ; his countenance was anxious ; tongue furred and moist ; pulse 132 and soft. He again tried to put his feet into warm water, but after making several resolute attempts, could not succeed, owing to the violence of the spasms they produced. On the blister being removed, the application even of the common cerate excited spasmodic action.

Twelve, A. M.—Symptoms but little changed ; he had frequent desire to pass water, but shuddered when he made the attempt ; heat of skin increased, and the countenance exhibited more marked symptoms of suspicion and distrust. At the suggestion of Dr. I. L. Bardsley, I determined to try the effects of the introduction of the vaccine virus into the venous system, and, also, into the arm and forehead.

Quarter past 1, P. M.—I procured some healthy matter from the arms of two children, and vaccinated him in one arm, and, also, in the forehead. Immediately afterwards, a vein was opened in the arm, and about five charges of the dried lymph, dissolved in water, introduced. He bore the operation remarkably well, and was afterwards put to bed.

Ten minutes to 3, P. M.—Spasmodic action appeared much increased, with shorter intervals, accompanied by considerable difficulty of breathing. He complained of pain from the blistered surface, and in the arm which had been operated on. In a few minutes he suddenly rose up, and said, "send for the doctor," and asked for something to drink, as he felt nearly suffocated. He was offered some tea and a little crumpet. He eat a little of the crumpet, and attempted to take some of the tea by means of a spoon. On raising the spoon to his mouth, the action of the throat was violent, and he had great difficulty in swallowing a few drops of the liquid. This effort required great resolution, but he appeared much easier after swallowing the tea.

Quarter to 4.—He said that he could scarcely breathe, and would like to drink if it did not excite so much pain. He asked repeatedly for medicine. He had passed an evacuation of dark-coloured hard masses. On offering him some warm milk, he beckoned with his hands to have it taken away; but on asking him whether he disliked it, he expressed the relief he felt on swallowing a little fluid.

Half-past 5.—During my absence he asked for drink, but was unable to take any. Had passed urine frequently in small quantities.

Half-past 7.—An enema was administered, consisting of half an egg and beef broth. On pouring the enema out of one basin into another, he became much excited.

Half-past 9.—The secretion from the nostrils being copious, he attempted, by means of his handkerchief, to remove it. In doing this, his hands trembled as usual, and the pharyngeal spasms came on. He appeared very thirsty, and frequently asked for something to drink; but the same effects followed on his attempting to swallow.

Eleven, P. M.—Symptoms the same; pulse 154.

January the 10th, 8, A. M.—I did not remain with him longer than the last date, but his symptoms did not alter much until about 5 o'clock this morning; about this time the dread of swallowing increased, and objects of various kinds disturbed him more violently. He sat in his chair, with his head downwards, and did not seem inclined to speak, taking no notice of the persons in the room. Pulse 160. The least touch of the finger disturbed him On being shown some tea, he desired it to be put away with great earnestness, but consented to wet his fingers, and hurriedly applied them to his lips.

Half-past 10.—Continues about the same, but apparently rather more calm. During my absence, he dipped his hand into a bowl of water, in order to wash his face, applying the soap in the usual manner. This operation required great exertion on his part, and was done in a tremulous manner, as it excited spasmodic twitchings.

Twelve, A. M.—Complained much of a sense of fulness and suffocation about the lower part of his

chest, which suffocation he described as ascending up to his throat. He also complained of great pain about his stomach. He was continually rubbing these parts with his hand. On my requesting him to show me the exact situation of his pain, and, at the same time, pointing with my pencil, it excited violent spasmodic action, and he shrunk back with alarm. This was the case when any bright object caught his eye. The passing of persons about the room, or the entrance of individuals through the door, did not, however, disturb him ; nor did he take any notice of the noise occasioned by various operations going on in the house.

Half-past 12 to 1 o'clock.—During this time he had two very violent attacks of spasm, crying aloud in a piteous tone, and raising himself in a half elevated posture, apparently in excessive pain. The chest heaved in a convulsive manner, and he endeavoured, between the spasmodic attacks, to alleviate the pain, by incessantly rubbing the parts, first clapping his hands, and rubbing his fists together, with eagerness, for two or three minutes; then striking his thighs rapidly with both his hands. The paroxysms were very violent, the spasms appearing universal, the whole body being in active motion. During the first paroxysm, and whilst the chest was heaving in convulsive action, he applied one hand to the left eye, and afterwards told us he felt excruciating pain, and smarting, in that part. He then stamped, with violence, for a few moments, with both his feet, on the floor, and afterwards rubbed the lower part of the abdomen with his hands. I now applied a grain of the acetate of morphia to the

abraded surface of the neck, and purposed to repeat it frequently whilst the violent spasmodic action continued.

Quarter to 2, P. M.—Has had another violent paroxysm, accompanied by loud cries denoting an excessive degree of pain. He continued the same actions as before, viz. rubbing the parts affected, clapping his hands, striking his thighs, and stamping with his feet, &c. On the spasms leaving him, he rose from his chair, and, looking suspiciously at all around, seized, with one and sometimes both hands, on the edge of the table, and thus remained in the corner of the room.

Two o'clock.—On my asking him to allow me to remove my large stick, which I perceived annoyed him; he looked at me earnestly and suspiciously, and then, in a tremulous rage, seized upon the stick, and threw it, with great violence, at me. He then took it up again, and struck me severely on the back of my hand. He next attempted to kick an individual in the room, laying hold of him, with both hands, in a violent manner. After this, he ran through the adjoining room, and laid hold of the clothes of a female, who, frightened at his unruly behaviour, was retreating up stairs. On releasing her from this awkward situation, he spied his opportunity, and suddenly opened the back door, and ran into the yard. I brought him into the house and fastened the door, but he drew the bolt, and attempted, with great violence and pertinacity, to unfasten the latch, which I had secured by means of leaden rods. On removing him from the back room, he attempted to get out by the front door. I held

him, and asked if the door was locked, on which he instantly said "it is not, it is not." He then, on being foiled in this attempt, proceeded to toss, in various directions, the articles that lay upon the table. In consequence of a crowd collecting in the street, a blanket was put at the bottom of the window, to prevent our being overlooked. He snatched at it eagerly, and frequently struck at the window. He did not take any notice on our speaking to him, and appeared to recognise no one in particular. Being placed on a chair, he joined his hands, muttering aloud. The violence of the symptoms now appeared to abate, and he walked into a corner of the room, and very cheerfully offered to shake hands with me. He then asked for some milk, which was given to him in a cup, together with a spoon. He now invited us, in a very interesting manner, to partake of the milk, one by one, making himself the last person to be served. He was well aware whose individual turn it was to take the milk, and insisted, by motion, on a strict adherence to the regular order. When his turn came, he exhibited great unwillingness to take it, but on being pressed as to the unfairness of refusing, he made many resolute attempts, and sometimes managed to swallow a few drops, but more frequently threw it away. He next asked for some currant jelly and some water, and mixed them both together, but it was only by great exertion that he got a small portion into his mouth, which he did not swallow, and, at the first opportunity, threw the whole into the fire. These attempts to swallow brought on the pharyngeal spasms and tremblings as before.

Quarter to 3.—Continued calm. After amusing himself, for a short time, with throwing an orange between my legs, he sat down in his chair, and, on hearing a female remark that a boy was peeping through the window at him, shook his fists, as if to terrify the intruder, accompanying this action with some threatening words. He now consented that I should dress his arm, which was uneasy, and, when I had finished, he gave me some copper, and requested that some beer might be sent for, in order to repay my kindness. He then dressed himself, and began to smile, and talk, on various subjects, in an astonishing manner One grain of the acetate of morphia was again applied to the blistered surface.

Four, P. M.—On my re-entering the room, he looked suspiciously at me, apparently as if he thought I was going to touch him, or to disturb the blistered surface. However, on promising not to annoy him, he came and sat beside me, and, at my request, repeated the letters of the alphabet. In a few minutes he started from the chair in a terrified manner.

Half-past 4.—He was now quiet, and requested me to read him a lesson, which he repeated, several times. in an audible tone.

Five, P. M.—Pulse 168; more feeble and soft, but rather fluttering.

Half-past 5.—Continued the same. Talking in a quick and rational manner as before.

Half-past 6.—He continued to talk and to examine different objects, but not in so rapid a manner. The light of the candle seemed to annoy him on putting it near him. His eyes began to have a very heavy

appearance, and the pupils appeared rather contracted. His general look was dull and heavy. He was employed in kicking a rag about the room, which he supposed to be a cat. I put a glass suddenly before his face, but it did not affect him. I now examined the scars above his left eye, and thought they appeared slightly inflamed. I had examined them frequently before, but could not perceive any difference.

Quarter to 8.—I had been absent nearly an hour, during which, his attendants said, he had been rambling about the cat, and kicking the rag about as before. Previous to my leaving him, he had promised me (under the expectation of reward,) to attempt to sleep, but very soon after lying down, he started up, and told those about him that a mouse had been running over his face, and that another had been biting his feet. He had a very heavy appearance about the eyes. He moved frequently from one part of the room to another.

Twenty minutes past 8.—He was much weaker, as he required the support of another person to enable him to walk about the room. I administered another enema. He asked for some water, but could not drink any, owing to the violence of the spasmodic action which the attempt excited.

Ten minutes past 9.—The pulsation of the heart was very quick. He had slight spasmodic twitchings at short intervals. When they came on, he projected the tongue forward in his mouth, and it seemed to be swelled, and, as if twisted on one side. He talked as rationally, although not so volubly, as before.

Quarter to 10.—He could not rest for a minute together, but he constantly moved about the room, and examined the several objects that attracted his notice.

Ten, P. M.—He was busily engaged in pouring water out of one cup into another, without apparent emotion. The cough was hoarse. He put his finger into his mouth, and brought out a little thick dark-coloured saliva.

Half-past 10.—Was constantly in motion. At this time there was the first appearance of froth from the mouth. It was ropy, and he had to pull it away with his fingers. Was again engaged in pouring water out of one cup into another, and even washed the cups with his hands, without any apparent emotion.

Quarter past 11.— Reclined on his father's knee, but very often talked, or seized something which was upon the table near him His features gradually assumed a more anxious and drooping appearance. Eyes very prominent. More froth escaped from the mouth.

Half-past 11.—Had put a little bread and butter into his mouth, but did not attempt to swallow it. Reclined on his father's knee, seemingly much weaker. Slight spasms or twitchings of the throat. Pulse weak but very quick. Gurgling in the throat, which was full of phlegm. He asked, occasionally, for any thing he wanted, distinctly but feebly. Croupal noise in breathing.

Quarter past 12.—Convulsive heavings of the chest Gurgling in the throat as before.

Half-past 1.—Continued the same. Having put him into the cradle, he remained quiet, except when the spasmodic twitchings occurred.

Ten minutes to 2.—Remained in the cradle, rambling about marbles; he fancied he was playing with his companions. When the convulsive spasms occurred, he elevated his body, and expressed his pain by a feeble cry; but directly afterwards leaned backwards and remained quiet. He dozed for a few moments. His respiration was very laborious and heavy, and he was decidedly weaker, as he could not remain, even a few moments, in the half-erect posture, Still rambled about the marbles.

Quarter past 2.—Rose up suddenly, and cried aloud, putting his hand to his throat; the spasmodic action and sense of suffocation, were, at this time much stronger.

Half-past 2.—On hearing one of the nurses say something, he repeated, two or three times, the same words. Talked incoherently of some circumstances which, by his countenance, appeared to interest him. He then raised himself in the cradle, and I requested him, in suitable terms, to allow me to remove him, in order to administer an enema. In a few minutes after, by the help of a nurse, he rose, but on his feet touching the ground, he danced with his legs, and seized on the nearest object for support. He was placed in a chair, where he remained comparatively quiet. His countenance was very anxious and eager when he fancied he was talking to his companions about the marbles.

Three o'clock.—I asked him to let me look at his tongue, which he put out twice; it appeared quite

moist, and I could not perceive any quantity of saliva in the mouth. The light of the candle did not affect him. He rambled upon various subjects. He asked for some water, which I poured, from a considerable height, into another cup, but it made no evident impression on him. On offering it to him he refused to drink, and, in a few minutes afterwards, he cried aloud that some individual was pouring water on him.

Ten minutes to 3.—Talked incoherently, probably about marbles, fancying his companions had taken them. He attempted to rise from the chair, when the nurse gently lifted him upon her knee. I now administered an enema with a small quantity of laudanum. He was slightly convulsed on my introducing the pipe. I then retired into the adjoining room, for two or three minutes, in order to wash my hands, and heard the nurses say he was comfortably asleep. On examining him, however, I found that life had fled.

A post-mortem examination was permitted, and took place early in the afternoon of the same day, in the presence of several medical friends.

We first examined the supra-orbitar and nasal branches of the fifth pair of nerves, which supplied the parts bitten by the dog, and they were, apparently, healthy.

On carefully examining the brain and its membranes, no morbid appearances were detected. The vessels were unusually empty, and the cortical substance was thought, by some present, to be rather paler than usual.

The spinal chord and its tunics were next minutely examined, but they did not present any deviation from healthy structure.

Thorax.—The heart was remarkably firm and contracted, and contained no blood. The lungs were of a dark colour in some parts, and in others more of a rosy hue. They crepitated as usual, and did not appear to contain much mucus. There was no fluid either in the pericardium or the cavity of the chest. The mucous membrane of the trachea, immediately before its bifurcation, was highly vascular. The submaxillary and sublingual glands were much enlarged.

On opening the pharynx, it was evident that this part had been much affected during life. The greater portion of its inner surface was intensely inflamed, and terminated in a defined line opposite the cricoid cartilages. The velum pendulum palati, uvula, and most parts of the pharynx, shewed considerable development of the mucous glands. The tonsils were slightly enlarged. The œsophagus was greatly inflamed near its termination, and, in one part the mucous membrane was slightly abraded. The whole mucous membrane was so softened, that the slightest touch of the scalpel separated it.

Abdomen.—The stomach was remarkably contracted and completely empty. Intense inflammatory patches were seen on the rugæ, which were very much developed. The mucus was very thick, and had, in some parts, an unusually deep colour. On one of the rugæ was observed a dark spot, about the size of a small shot. The stomach appeared healthy between the rugæ, but had, in some places, a darker

colour than natural. The mucous membrane of the duodenum displayed intense inflammation also, and the glandulæ solitariæ were exceedingly enlarged and very numerous. The bowels were not particularly examined. The liver was healthy. The gall bladder contained bile, and the urinary bladder about an ounce and a half of urine. Kidneys apparently healthy, as, also, the spleen. The whole of the nervous system was remarkably developed.

The par vagum, glosso pharyngeal, gustatory, pharyngeal and phrenic nerves, were in a healthy condition. The ganglia of the sympathetic were larger, and appeared of a deeper colour, than usual.

APPENDIX.

I have procured the following details respecting the dog, and, indeed, I had an opportunity of watching the animal for several hours previously to its death. Shortly after the dog died, I sent it to the anatomical rooms of my friend, Mr. Jordan, a very able lecturer on anatomy, in Manchester, where it was examined in the presence of his class. The following were the post-mortem appearances.

The lungs were of a very rosy colour, but their structure was healthy. The quantity of mucus in the bronchial tubes was small. The mouth healthy but very parched. The whole of the pharynx was of a deep rosy colour, which terminated in a defined line immediately opposite the cricoid cartilages. The larynx was healthy. A considerable vascularity was manifest at the lower part of the œsophagus, and

was continued into the stomach. On opening the stomach, a mass of substance was observed, which had certainly the external appearance of a bird's nest. On being separated, it was found to consist of straw, wood, leather, &c. These materials were in a remarkably dry state. Upon being removed, the mucous membrane was found to be covered, in many parts, with a tough mucus. The rugæ were particularly manifest, and upon their surface were observed, here and there, intense inflammatory patches, and, in other parts, black or dark brown streaks, which, in a few hours, became still more perceptible. The external surface of the stomach seemed to be healthy. The par vagum and nerves of the tongue were perfectly healthy. The salivary glands were of the usual colour and size.

I must not omit to mention one important circumstance respecting the dog, which strongly leads me to presume that uterine irritation may be a predisposing cause of rabies canina; and if more extended enquiries should corroborate this supposition, it may lead to some valuable curative or precautionary measures. The bitch was about two years and a half old, and, about a year and a half ago, had intercourse with a dog of a very large size, and, eventually, gave birth to two unusually large pups, which occasioned her much pain during parturition. The next morning it was discovered that she had eaten the greater part of the inside of both her offspring. The owner positively affirms it to be his belief that she had no connection with any other dog after that time. Both he and others have frequently seen her

refuse the familiar approaches of dogs in the street. For three or four days previous to her exhibiting any symptoms of madness, the uterine orgasm was present.

I must apologise for the length of these notes, and for the introduction of several seemingly unnecessary remarks; but, it should be remembered, that the case is one of extreme importance, and as I had the opportunity of witnessing the progress of the disease from the commencement to the termination, I thought it better to incur the charge of prolixity than of deficiency of detail.

I may, in conclusion, observe that, when I found the case to be one of decided hydrophobia, I sent invitations to a number of medical gentlemen, and, among those who attended and afforded me their assistance, I may mention Dr. Hull, Dr. Lyon, Dr. J. L. Bardsley, Dr. J. P. Ray, and Messrs Jordan and Stephens.

M.r Grindrod's Case of

of Hydrophobia.

AAAA. *Pharynx laid open, exhibiting high vascularity and developement of the mucous Glands.*

BB. *Considerably enlarged mucous glands.*

C. *Inflamed uvula.*

DD. *Inflamed tonsils.*

E. *Abraded surface of mucous membrane of lower part of œsophagus.*

F. *Line drawn through the centre of the inflamed rugæ of the stomach.*

G. *Vascular state of upper portion of the duodenum.*

ON THE VARIATIONS

IN THE

PREVALENCE OF CERTAIN DISEASES

NOT USUALLY SUPPOSED

SUBJECT TO EPIDEMIC INFLUENCE.

BY J. BROWN, M. D.

Physician to the Sunderland and Bishopwearmouth Infirmary.

THERE is a remark in the work of M. Laennec, which, so far as I have read, is peculiar to that excellent writer, and of the truth of which I become more and more convinced, with increasing experience. After stating that, during a period of three years, when he was the pupil of Corvisart, he saw more cases of extensive ossification of the valves of the heart, than he met with during the subsequent twenty years: he adds, "this organic lesion is not the only chronic disease which presents inequalities of frequency at different periods. Many other affections, not ordinarily regarded as subject to the influence of the Medical Constitution, *(Constitution Medicale,)* are really much more frequent in certain seasons than in others."

When I read this passage, many years ago, a conviction of its truth flashed across my mind from numerous illustrative instances, which I was at once

enabled to recall, and subsequent experience having multiplied these examples, it might not be uninteresting to the Association, were I to name certain of the diseases in which this varying prevalence has been observed.

The class of disorders first to be mentioned, consists of those which appear to have suggested the remark to Laennec—affections of the heart. My observation would lead me to regard, not merely that form of cardiac affection cited by Laennec, but the whole class of these diseases, as varying, in frequency of occurrence, at different seasons. From the year 1825 to 1828, inclusive, I frequently felt, and expressed, to my medical brethren, a surprise at the number of cases of this description that fell under my observation. Since the last-mentioned date, though of sufficiently frequent occurrence, they have been much less general than prior to it. It may be asked whether rheumatism, in which so very many cardiac diseases, in this district, have their source, was unusually prevalent during the period mentioned. The answer would, I think, be in the negative, but, with truth, it might be asserted, that rheumatism affected the heart much more frequently then than it has subsequently done. There was no reason to think that, during the period specified, the moral or other acknowledged causes of these diseases were prevalent in an unusual degree.

The disease which, of late years, has ebbed in its prevalence most considerably, (so considerably, indeed, that the question has, occasionally, occurred to me, whether there is again to be a flow, or whether, like the Mentagra of the ancients, it is to become

an extinct species,) is hydrocephalus acutus. A few years ago, this was the scourge of families and the opprobrium of the profession, the members of which despondingly opposed arms to a destroyer, whose ultimate triumph they foresaw, and beheld, in spite of their efforts, many a fair flower wrenched from its parent stem. Such scenes, from this cause, present themselves to my observation much less frequently than formerly; indeed, I would say that this disease is diminished, in frequency, within late years, in more than a ten-fold proportion, compared with its prevalence twelve or fifteen years ago. It still, occasionally, re-appears in "visits few and far between;" and, on these occasions, it is rare that one case only occurs; for, if I see but one, I hear of others in the practice of my brethren. There is another remark on this subject which experience warrants me in making, namely, that recoveries are much more frequent than formerly; so frequently, indeed, have they occurred, as to excite a suspicion of the identity of the disease with that which I attended some time before, with such melancholy forebodings. If, however, identity of symptoms is the test of identity of internal condition, I can, with confidence, say, that the disease I now witness is in its advanced stage, (it is frequently not until this stage that my first visit is made,) the same as that which I formerly witnessed, and that irregular pulse, dilated pupil, strabismus and torpor, do not now portend the same inevitable fatality as they did some time ago; and the language I feel warranted, in addressing to the relatives of patients labouring under such symptoms, is, consequently, less desponding than formerly.

With the view of discovering how far the train of circumstances which is witnessed here, corresponds with what is observed elsewhere, the Transactions of the Provincial Medical and Surgical Association, for last year, were referred to. Considerably above six thousand cases, of various diseases, are there reported, from Birmingham and Worcester, by Mr. Parsons and Dr. Streeten, and among these are but five of hydrocephalus, of which *one* was fatal. Independently of the extreme paucity of cases, we find the recoveries to the deaths as four to one. Those writers, of a few years past, who gave the most favourable report of the result of their practice, have nearly reversed the proportion which deaths here bear to recoveries. At Geneva, for instance, we learn, from Odier, the deaths were, to recoveries, as two to one; in Dr. Mills' practice they stood as three to one; while, of the cases reported in the valuable work of Gölis, the proportion of fatality to cures was a fraction more than six to one. Yet, as justly observed by Dr. Joy, these results form a pleasing contrast to the desponding views of Whytt and Fothergill, and the other early writers on the disease.* It would, of course, be a source of congratulation to an individual proud of the progress which our science has made within late years, could he fairly ascribe the diminution of mortality from this disease, to improvement in medical practice; but candour compels him to express his belief, that the difference of result is owing to greater tractability of the disease, rather than to any superiority of his own practice, and that of his immediate contempo-

* Cyclopædia of Practical Medicine, article Hydrocephalus.

raries, over the treatment employed by such men as Odier, Mills and Gölis. He may merely remark that the recovery, in several cases he has met with, supervened very immediately on the free discharge from a blister covering the whole scalp, though, in other cases, it has occurred under circumstances which rendered it almost certain that it was the result of a spontaneous effort of the constitution.

The next affection to be noticed, is one that cannot be supposed to owe its origin solely to any recondite cause, of the nature of that which probably gives occasion to the excessive prevalence occasionally observed in the other diseases we have mentioned; but the excess of its recent diffusion, compared with the degree in which it is ordinarily observed, would naturally lead to the conclusion that some unwonted cause was in co-operation with the palpable agent to which, alone, any isolated case of the kind might have been ascribed. Accidental injuries were followed, during the first six months of the current year, by diffuse inflammation and gangrene, in more cases than had fallen under my observation, not only during any equal period, but for some years. A trifling bite on the finger, from a horse; a prick in the hand from a splinter of teak timber; a contusion of the calf of the leg between the spoke of a wheel and a gate-post, not sufficiently severe, at first, to confine the patient for a moment; a blow from the cog of a wheel in a brew-house; these accidents occurring to healthy and not intemperate persons, produced an extent of gangrene, and a degree of constitutional disturbance, from which the patient narrowly escaped with life; whilst many

cases of minor importance, but yet severe, of diffuse inflammation, followed trifling injuries. Such occurrences were not confined to my own practice, but I heard of similar cases from some of my friends. It may not be superfluous to remark, that the early part of the period mentioned, was marked, as the winter of this rude climate generally is, by the prevalence of various descriptions of inflammatory disease; that, during the latter part of it, influenza was extremely prevalent, and characterized by intensely inflammatory symptoms; and that it was during the first division of the period, comprising the months of January and February, and during the last, from the latter end of April to the early part of June, that inflammatory and gangrenous affections were so generally observed to follow slight accidents.

It will not, I trust, be necessary to remark, that there is no intention, on the part of the writer of a paper of such humble pretensions as the present, to set up a claim of discovery, when he represents the affection of which he now treats, as subject to the law of epidemic prevalence. This would, indeed, be an absurdity, after the elaborate Essay of the late Dr. Duncan *Secundus*, in the Edinburgh Transactions; that of Dr. Scott, in the Edinburgh Medical and Surgical Journal; and Dr. Butter's Work, on what he styles the irritative fever of Plymouth. The disease mentioned by these writers was, so far as I can discern, identical with that which I have recently observed; and by all of them it was regarded as partaking of the nature of an epidemic. But, until these individuals promulgated their opinions on the subject, this disease had not been referred to the

class of epidemics; during the period of nearly ten years, which has elapsed since their publications, the attention of the profession has not, so far as I know, been recalled, to what few (after the authorities I have quoted,) will hesitate to consider as a fact, and, consequently, it may be a matter of question whether this is "an affection generally regarded as subject to the influence of the medical constitution;" or, whether it does not furnish an appropriate illustration of the remark of Laennec.

In the early part of 1832, more cases of cerebral apoplexy fell under my observation, than had been furnished by the whole course of some preceding years. Besides several cases occurring less closely on each other, in little more than one week, six fatal examples of the disease fell under my observation. It is true that these attacks occurred to individuals, who, from constitution and period of life, would have been thought likely to become subjects of such an affection; but the circumstance that, in so short a time, the predisposition should have been brought into action in so many persons, affords the aspect, at least, of some general cause co-operating with the diseased tendency. This is not the sole period in which a diffusion of apoplexy, that might be deemed epidemic, has been observed; indeed it rarely occurs in my practice, in a manner that appears purely sporadic; and the period of its prevalence has more frequently been the winter, or early part of spring, than a warmer season, when some effect might probably have been ascribed to insolation. It has, in fact, coincided, in the period of its prevalence, with inflammatory diseases in general.

With regard to these last-named diseases, as they are generally considered to be the product of atmospheric influence, either hidden or manifest, they ought not, perhaps, in strict propriety, to be noticed in an essay, professing solely to furnish examples of the variable prevalence of diseases, not usually thought capable of assuming an epidemic character. They are adverted to here, for the sake of calling the attention of the Association to the simultaneous occurrence of many cases of the same disease, or of diseases strikingly congenerous of this class. Thus, at one time, we shall see many examples of enteritis; at another period, the inflammations we witness, shall be seated in the thoracic cavity. This last has been the case during the present year, (1833,) the internal inflammations which have occurred here, having been situated almost universally in the chest, the affinity being thus marked to the great epidemic of the year, influenza. Within a very few days in July of this year, four cases of pleuritic effusion, more or less of a chronic character, fell under my observation. Of these cases, one entirely recovered by the employment of general and local remedies; on one, (a boy 13,) the operation of paracentecis thoracis was performed, above 80 ounces of well-formed purulent matter were at once evacuated from the thorax, a great deal more has subsequently been discharged, and, at this date, (September the 20th) there is a good prospect of the patient's ultimate recovery. To one of these cases I was summoned on the 8th, to the other on the 9th, of July. The other two cases mentioned I saw only incidentally. They are still, I understand, under treatment.

Some years ago it fell to my lot, to witness, frequently, the varying prevalence, and the variable intensity, in the symptoms of a disease, one cause of which being distinctly understood, the profession has not been disposed, and, perhaps, will not yet be disposed, to admit that another may modify its diffusion and its phenomena. I allude to syphilis. Not only is there a wide difference in its prevalence in different localities, and, at different times, in the same locality; but, under such circumstances, a very wide range indeed is observed in the intensity of its symptoms. At certain periods, or in certain places, not merely suppurating bubos are more frequently met with, but the much worse symptoms of rapid gangrene, or slowly consuming phagedæna, threaten the patient with the most melancholy of mutilations, and add to the difficulties of the surgeon. So frequently, some years ago, did I witness this occasional aggravation of the symptoms of this disease, without any assignable cause, except, possibly, an epidemic condition of the air, affecting both its diffusion and its intensity, that nearly every lapse of chastity was followed by condign punishment; and which condition appeared to me to furnish the real explanation of its ravages at the close of the fifteenth century, ravages which gave rise to the absurd fiction of importation from the newly-discovered America. Arguments to illustrate this view of the calamity, which, at the epoch mentioned, fell so heavily not only on the commonalty, but on popes, kings, cardinals, and whole convents of *devout* and *chaste* nuns, would be misplaced in the present paper, and would, besides, be rather difficult

to treat by one (to use the expression of Celsus,) "*et pudorem et præcepta artis servante;*" but all who have taken pains to examine the not unamusing records of that period, will agree that it is a more rational explanation of what occurred, than the doctrine of importation hatched by Oviedo, and, subsequently, fostered by Astruc.

These examples will probably suffice, to call the attention of the profession to the remark of Laennec, and may be, in some degree, instrumental in directing their researches to a branch of our science, etiology, which has not, of late years, been so much cultivated as other departments of medicine. That the current of medical industry has recently set, very exclusively, to the illustration of the intimate nature of disease, by scrutinizing, with the scalpel, the changes of structure it has effected, must be manifest to all who are acquainted with the professional literature of the times. In a neighbouring kingdom this pursuit has been cultivated in rather an abstract method, as if morbid parts were objects of art or natural history, and valuable *per se;* but so much are we indebted to our indefatigable and ingenious neighbours for the mass of information afforded us, and likewise for the spirit of research which they have been, in some degree, the means of engendering among ourselves, that it would ill-become us to be severe upon them for any misdirection of their investigations. The practical character of our countrymen has been displayed in the spirit in which they have conducted similar researches, ever having in view real good—the improvement in the treatment of disease which was likely to result from them. It

is with no view of decrying pursuits of so much value, that I endeavour to impress on the profession the equal importance of one great object of our Association, the tracing of the rise, progress, and decline of diseases. Had a series of successors followed in the path of Sydenham, like him, sagacious to note, and industrious to record, variations in the prevalence of disease, a mass of information would now have been possessed, whence some medical Newton might have deduced general laws, which, as yet, we look for in vain. Circumstanced as we are, at present, industry in collecting and arranging facts, of this nature, is the quality we are principally called upon to exert, and, at a future day, when the amount of our knowledge shall be greater, some superior mind will be found to reduce our "*mémoires pour servir*" into a regular history of epidemics, and to illustrate, by them, that obscure branch of our science, the etiology of diseases.

A CASE OF
TUBERCULOUS AFFECTION
OF THE
RIGHT KIDNEY,
WITH
EXTENSIVE DISEASE OF THE SPINAL COLUMN,
PRECEDED BY THE EXPULSION OF A BILIARY CONCRETION.

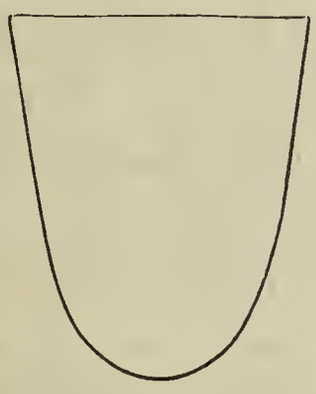
BY JOHN PRICHARD, ESQ.

Surgeon, Leamington.

Mademoiselle Le Noir, æt. 68, had, up to the period of the illness I am about to describe, enjoyed excellent health, interrupted only by occasional attacks, said to be from gall stones, three of which attacks, (to use her own words,) "were dreadful and acute, although no gall-stones were ever known to have passed." The last date of her thus suffering was in 1818.

June 14th, 1828.—She consulted me for a very acute pain; referred to the sacrum and the front and middle of both thighs, especially the right. Pain nearly constant, and much aggravated by the recumbent posture. The commencement of this affection was dated from June, 1827, when, after muscular exertion, pain was suddenly felt in the thighs, and, shortly afterwards, in the sacrum, increasing from that moment to the previously named date. The general health was tolerably good. The spine generally bent in its whole column, but without any angular curve at this time. Considerable pain, on pressure, in the region of the kidneys, and occasional irritation of the bladder. I thought that calculus existed somewhere;

in the bladder there was none, but the probability remained that the ureter, or the pelvis of the kidney, was the seat of mischief. Red sand, composed chiefly of lithic acid, was passed from time to time. I prescribed a course of alkaline medicines, and twice cupped her on the loins. From these remedies some relief was obtained, and on the 13th of July, my patient went to London, much improved. She there, at my request, consulted two eminent surgeons, whose opinion coincided with my own, as to the probability of the existence of renal calculus. Shortly after this she went to Paris, and the effect of her journey was greatly to increase her sufferings. In a letter dated November the 5th, 1828, she thus describes the passage of a remarkable stone from the rectum. "The sketch annexed will give you some idea of my sufferings, when I tell you that it is the dimensions of a calculus passed from my bowels." "I had suffered more than my usual torture, *at the bottom of my back and in my thighs,* through the night; and, in the morning, to my surprise, I found this stone in the night vessel; I had passed a very small one the day before, but it was too small to notice." This calculus, which is clearly a biliary concretion, is in my possession.



April, 1829.—Miss Le Noir arrived in London, and was there attended, for a short time, by Mr. Guthrie and Dr. Kerrison. They suggested the trial of caustic issues.

May the 31st.—She was again under my care, when, from the effect of her journey and the progress

of disease, her sufferings were extreme. Day and night she remained on her hands and knees, unable to bear the torture of any other posture. Pulse 78; tongue clean and moist. A very considerable angular projection had then discovered itself about the lower dorsal vertebra. I applied two caustic issues.

June the 8th.—Fever, with delirium; numbness of the left leg; tongue dry and dark; pulse full and frequent. Bleeding and active treatment were resorted to.

12th.—Fever abated, and the pain much more endurable. Total want of power in both legs.

20th.—Fever subsiding, but the tongue still dry and dark.

21st.—Had vomited about three pints of a coffee-ground-like matter. Hiccup. Tenderness of the abdomen, especially of the right side and epigastrium. Pulse 88 and intermitting. A dose of calomel and opium was given, with effervescing saline medicine.

22nd.—The discharges from the bowels were black. Pain nearly gone, except on moving. Some power of sensation, but none of motion, in the legs. No sleep; tongue dark but more moist; pulse 88. The curvature has increased.

27th.—Pulse 80. Acute pain in the ankle and knee joints of the right leg.

28th —The pain had ceased. She had slept tranquilly.

29th.—Better; nearly free from pain. Pulse 80, weak and intermitting; tongue covered with aphthous crusts in the centre, glazed and red at the edges. Secretions from the bowels improving.

30th.—Had experienced, occasionally, an acute sense of constriction at the epigastrium, which seemed to alternate with pain in the feet.

From June the 30th to July the 13th.—Improving. A decided diminution of numbness in the legs. Occasional spasm in both limbs, especially in the right.

To August the 16th.—Improving. The muscles begin to be influenced by attempts to move the toes of the right foot.

September the 17th.—Inflammatory fever came on, with diminished power in the limbs. This attack was subdued by bleeding, &c. and alluding to the 27th I find the following note.

"Motion much improved in right leg; left leg still powerless, or nearly so. Violent spasms of right thigh and leg."

October.—Went on improving.

From November the 11th to the 14th.—Urticaria with fever. Diminished power in the limbs; more pain in the back. Tongue furred and dark; pulse 95. Bleeding, &c. was again had recourse to, and the fever abated.

16th.—Violent spasm in the right leg, during which the limb was involuntarily raised to a right angle with the trunk; increased power followed. The left leg made but little advance. Bowels free; tongue clean. No paralysis of the rectum or bladder had, as yet, evinced itself.

November and December.—Through these months there was a gradual amendment. The strength increased. The pulse became regularly at 80. The appetite good, and comfortable sleep was obtained by the aid of Dover's Powder. The left leg, also,

began to show signs of returning power, first spasmodic, then voluntary.

January, 1830.—Through this month both limbs went on improving; the power of sensation, which, indeed, had never entirely left them, was now restored, and the power of motion in the right leg was nearly natural.

February.—The power of moving the lower part of the back, hitherto entirely lost, now began to return.

16th.—On examining the back, a tumour was discovered in the region of both kidneys; that on the right side being circumscribed and much more elevated than that on the left: on both sides, but more especially on the right, a pulsation, synchronous with that of the radial artery, was clearly perceptible, and I find, in my note, the following Question. "Aneurism, or abscess with pulsation communicated?" Whilst these tumours, especially that on the right side, went on increasing, the power of moving the limbs daily improved, and the general health remained stationary.

April.—Bilious vomiting. Increased pain, subsiding after a few days. The tumours increasing, and the pulsation now remarkably strong.

May.—Recurrences of bilious vomiting from time to time.

June the 3rd.—Numbness of the pelvis. Fever; vomiting; diminished power in the limbs; bowels torpid.

14th.—The rectum and bladder partially paralyzed. Pain, and sense of numbness, in the pelvis. Hiccup; pulse 70; tongue clean and moist; sleep-

less nights. Pulsation more defined in the left tumour.

30th.—Occasional stabbing pain in the left tumour. Bladder paralysed; urine dark coloured, scanty and muddy; abdomen much distended; entire loss of power and sensation in the limbs, and from the pelvis downwards.

July the 2nd.—About this time there was a remarkable rally, which seemed to depend on the getting rid of considerable quantities of pus from the bladder. This amendment continued up to July the 8th, when another attack of irritative fever came on, and induced an aggravation of all the symptoms. The right tumour had diminished very evidently, and the pulsation in it was less perceptible since the frequent discharges of pus from the bladder.

16th.—About ℥ii. of pure pus passed. From this date to September the 20th, my patient gradually became worse, and that night terminated her sufferings.

Post-mortem examination, twelve hours after death. The general appearance of the abdominal viscera, *in situ*, natural.

The stomach contained a quantity of dark fluid, by which it was much distended.

The spleen was very small.

The liver was unnaturally small and very pale, except in the neighbourhood of its anterior edge on either side of the suspensory ligament, where it was pretty much coloured by bile. On a cursory examination, it was difficult to discern any thing like a gall bladder, but, on further investigation, this organ be-

came evident, in the form of a semi-cartilaginous membrane, puckered up into several elevated folds, within one of which a small gall stone was lodged. No bile, nor appearance of bile, could be detected in any part of this membrane. The cystic duct of a natural size, proceeded, downwards, from a portion of it, *and its internal coat was deeply tinged with bile.* The hepatic duct was natural, as were the *pori biliarii* and the *ductus choledochus.* The right kidney, much enlarged, weighing 12 oz. formed the external tumour. Its adipose and cellular investment adhered firmly to it, and the lower and back part of which shewed marks of recent inflammation, being, in its thickened state, inseparable from the organ itself. The renal arteries, veins and ureter, were healthy, excepting that the latter contained curdy pus. A section of this kidney exposed a mass of extensive disease, the centre of which had a firmly gelatinous character, and was intersected by white bands. In other parts the appearance was tubercular, more or less advanced to a state of *ramolissement;* its superior portion, from which the discharges of curdy purulent matter from the bladder proceeded, was in a state of suppuration.

The left kidney weighed 4 oz. and was tolerably free from disease, excepting that, on its surface, a small hydatid had formed.

The bladder, small and very much thickened, contained about ʒiss. of thick fœtid urine, mixed with the curdy pus from the right kidney.

The aorta, where it passed over a considerable protuberance of the spine, firmly adhered thereto, and its external coat was inflamed in patches, and, in parts, firmly ossified.

A considerable protuberance presented itself about the last dorsal and first lumbar vertebræ, and the psoas muscles, on either side, bulged out laterally. On removing this portion of the spine, and examining it, it appeared that the spinous processes of the last dorsal, and the first and second lumbar vertebræ, were separated from their bodies, and partook of the morbid changes surrounding them. The first lumbar vertebra was converted into a soft carious mass, having partially the same character of tubercular *ramolissement* as the kidney. The dura mater, in the vicinity of this mass of disease, appeared healthy; on opening it, the medulla spinalis had evident marks of recent inflammation, and the pia mater investing it and the proceeding nerves, were much injected. On removing the psoas muscles, several tumours, as large as a walnut, appeared, closely attached to the spine, two on one side and one on the other, having the same character of scrofulous tubercle as the other diseased parts. It is matter of much regret with me, that circumstances prevented so accurate an examination of the intestines as the case called for, but I doubt whether further investigation would have elucidated, satisfactorily, the interesting question—How, and when, did the gall-stone pass into the bowels? Certainly not through the cystic duct, for its size was natural. The gall-bladder had clearly burst, and it seems improbable that the escape of this enormous stone should have occurred since the last violent attack of pain in the side, about ten years ago. Had it, at that period, made its way into the bowel by the processes of inflammation, adhesion, ulceration, &c.? If so,

surely it would not have occupied ten years in its passage through the canal. Nor would evidence of this adhesion have been wanting after death.

I think this case remarkable, also, as shewing at what an advanced period of life scrofulous disease may affect the spinal column. Nor is the singular pulsation, without interest; traceable, as I believe it to be, to no other cause than that of increased action in the renal arteries, the result of morbid growth.

A CASE OF UTERINE HYDATIDS.

BY WILLIAM DANIELL WATSON,

Surgeon, Warwick; Member of the Royal College of Surgeons, Edinburgh.

Before entering upon the details of this case, it may not be improper to advert to the previous state of health of the individual who forms the subject of it, and who, at the period of its occurrence, was about twenty-two years of age, and had been married nearly ten months.

Of a lymphatico-sanguineous temperament, her whole appearance indicated the utmost delicacy of constitution. She had, for some years, suffered from periodical head-ache of the most distressing severity, attended by considerable determination of blood to the head, with very irregular and violent action in the carotid arteries. Her general health had materially given way under the influence of these repeated attacks; added to which, the menstrual discharge had never been correctly established.

General blood-letting, blisters and purgatives, constituted the remedies usually employed to subdue these attacks; affording, however, at best, but a temporary and partial relief.

In the early part of the present year, on the recurrence of one of these attacks, I was consulted, for the first time, when considerable disorder of the digestive functions existed, consisting of excessive irritability of the stomach, constant sickness, and an inability to retain any thing even for an instant.

The bowels were very irregular in their action; the dejections most unhealthy in appearance. The urinary secretion small in quantity, and depositing a considerable sediment. The pulse remarkably full; the tongue foul. The most prominent symptom, however, next to the sickness, was the violent and distressing pain in the head.

From eight to ten ounces of blood were immediately abstracted, by cupping, from the back of the neck, which afforded instantaneous, and, almost, permanent, relief from the head-ache.

Leeches and blisters to the epigastrium, together with aperients, formed the chief part of the subsequent treatment, under which she steadily and gradually recovered.

Having consented to an issue in the leg, I established one before discontinuing my visits; and so marked had been the advantage derived from it, that, up to the period of my second attendance, she had enjoyed an almost uninterrupted state of health. The menstrual discharge persisted in its former irregularity.

On the morning of the 27th of May, 1833, I was again summoned to attend her. She was in bed, and complaining of most violent pain in the bowels, and, in short, nearly all round her body, together with a strong sensation of bearing down. On ap-

N. Rider. Del. & Lith.

Mr Watson's Case of Uterine Hydatids

plying the hand to the abdomen during a paroxysm, I found the uterus firmly contracting, and occupying a space equal to that of a pregnancy of five or six months. There had been a coloured discharge, she then informed me, for the last eight weeks. She had no suspicion of being pregnant, nor was she at all conscious of any increase of size, and appeared not a little surprised when, on my directing her to place her hand upon her bowels, she discovered, for the first time, the increase, in volume, of the abdomen. Under the impression that she was about to miscarry, I administered an opiate draught, and directed the application of cold externally. She had rigors, with accelerated pulse; a white and clammy tongue; considerable thirst; bowels open. On repeating my visit, in half an hour, I was informed that the draught had been rejected. The uterine action was, nevertheless, going on vigorously, and, at the moment of my entering the house, something was expelled from the uterus, which an attendant was proceeding to remove, but, from the unexpected and novel appearance of what presented itself to her view, she withdrew in considerable alarm, and requested my immediate attendance.

The cause of alarm consisted of an enormous growth of hydatids, of the grape form, weighing twenty-six ounces, of which the annexed engraving is a correct representation. Very little hæmorrhage followed the expulsion of this mass of hydatids; and, although much relief was obtained by it, it was evident, from the character of the pain which continued, and from the external examination of the uterus, that something more was yet to pass.

The immense clustres of grape-like hydatids were connected with, and depending from, a substance of considerable extent, having much the appearance of omentum. The portion which had evidently been in connection with the uterus, appearing particularly solid, I divided it with my scalpel, but it consisted of nothing more than a condensed collection of smaller hydatids, mixed with the substance already alluded to.

On questioning her as to her feelings and state of health previously to the commencement of pain, she informed me that, on the day before, she was as well as usual, and had taken a walk. That towards evening she experienced a sensation, as of some heavy substance falling from her stomach, which gave her pain, and a good deal of uneasiness in her bowels and thighs. The uterine action, however, did not commence until the following morning, the 27th of May.

In consultation with a physician, Dr. Luard, a common effervescing draught was directed to be taken every three or four hours.

Eight, P. M.—On visiting our patient this evening, we were pleased to find that she had passed another large bunch of hydatids, solid, and resembling the firmer part of the first; in size, about half as large again as a cricket ball. The pain speedily ceased after this had taken place, and, as there was very little hæmorrhage, we found her infinitely more comfortable than, under such circumstances, was to have been expected. The pulse was 80, and full. Heat of skin slightly augmented. The tongue clean, but white, attended by some thirst. As considera-

ble tenderness of the abdomen prevailed, and the bowels had not been relieved since morning, twelve leeches were applied to the umbilical region, followed by fomentations and poultices. The saline draughts to be continued. Diet to consist of thin gruel, barley water, lemonade, &c. &c.

28th, Nine, A. M.—Has passed a good night, and is, in all respects, very comfortable. Pulse 85 ; skin cool ; tongue moist and rather white; thirst diminished. Feels but a slight degree of pain. The lochia small in quantity and pale. Has experienced great relief from the leeches to the bowels, which are much less tender, although no evacuation has, as yet, taken place. No shiverings. To take the following draught every four hours. ℞ Sulphatis Magnesiæ, ʒiij. ; Infusi Rosæ, ℥iss. ; Misce fiat haustus. To continue the saline draughts as before ordered ; as, also, the diet.

Five, P. M.—The bowels have been freely opened, attended with much relief to the general feelings. The dejections healthy ; pulse 80 ; skin cool. Is free from pain, and appears, in all respects, much better. To continue the saline draughts.

29th, Eight, A. M.—The former part of the night was passed in quiet sleep. Towards morning had slight shiverings, with general indisposition. Upon enquiry, the mammæ were found to be swelled, hard, and excessively tender. A good deal of milk had escaped. Independently of the little excitement caused by the secretion of milk, she is as well as at the last report. The abdomen perfectly free from pain and swelling ; bowels have not been moved since last visit. A few detached hydatids have passed

during the night. The discharge from the uterus remains much the same. To have the breasts drawn and fomented. Continue the saline draughts.

Eight, P. M.—The bowels have been relieved. Great benefit derived from drawing the breasts, and the quantity of milk removed, considerable. Has had sleep, and feels refreshed and very comfortable in all respects. Discharge continues as before stated.

It is unnecessary to multiply the daily reports from this time, as her amendment gradually proceeded to complete recovery. The secretion of milk remained for some time, but, at length, subsided without any particular occurrence. The most troublesome symptom which I had to contend with, was an unceasing discharge, of a sanguineous kind, from the uterus. Medicine appeared to have no effect upon it whatever, and it finally only yielded to injections of Port wine and water. Since this period she has enjoyed, I may almost say, robust health. I have not, however, had an opportunity of learning whether the catamenia are established.

Observations.—As cases of the above kind are universally allowed to be of extremely rare occurrence, and as, at the same time, there are some peculiarities about the present one, not generally noticed by writers on the subject, I cannot conclude without making a few remarks relative to them, in the hope that they may be the means of directing the attention of the profession to this singular disease, and thereby of rendering them prepared to meet the exigencies of the case whenever it may occur.

1st. A vast variety of opinions have been entertained as to the origin of hydatids in the uterus.

The latest and most talented writers, however, on the subject, are disposed to consider it as depending upon some peculiar informality in the growth of the impregnated ovum; and, in support of this opinion, endeavour to impress upon the minds of their readers, that the membranous bag invariably found, as in the impregnated uterus, is the medium of connection between the uterus and the hydatid growth.

2ndly. That uterine hydatids or vesicular mole, cannot exist independently of sexual intercourse.

3rdly. That considerable difficulty, at all times, presents itself in determining the exact nature of the disease, especially in its earlier stages, and also in distinguishing it from pregnancy.

4thly.— That the principal danger to be apprehended, is the very alarming hæmorrhage which *generally* attends the expulsion of the hydatid mole from the uterus.

The chief peculiarities of the case before us, consist, first, in the absence of the membranous bag, so strongly insisted upon by some writers, as being *invariably* present. In this instance there was not the slightest appearance of any thing of the kind, neither at the time of expulsion nor subsequently. Neither could it have passed away in a gangrenous state, for during the first weeks after that event, the discharge was so trifling, and, at the same time, so pale, that had any thing of the kind existed and passed, it could not have escaped observation. Secondly, after the expulsion of the first cluster, as well as after the second, no hæmorrhage, possessing, in the most remote degree, a violent character, supervened. On the contrary, the discharge was remarkably small in

quantity. It is, also, worthy of remark, that the patient herself was perfectly unconscious of any change in her person, which could lead her to the supposition that she was pregnant; and even at the moment of my first visit, on the morning of the 27th, assured me, as already stated, that she had no reason to suppose any thing of the kind existed. In conclusion, I beg to refer the reader, for further information on this interesting subject, to the very able publication of Madame Boivin, entitled "*Nouvelles Recherches sur l'origine, la nature et le traitement de la Môle Vésiculaire, &c. par Mm. Veuve Boivin, &c. &c. &c. Paris,* 1827;" and, also, to the more recent work, by the same author, in conjunction with M. A. Duges, called "*Traité Pratique des Maladies de l'uterus et de ses annexes, &c.*" A very instructive paper will also be found in the "Cyclopædia of Practical Medicine," article, "HYDATIDS," by "Dr. Kerr."

SINGULAR CASE OF A FOREIGN BODY

FOUND IN THE HEART OF A BOY.

BY THOMAS DAVIS,

Surgeon, Upton-upon-Severn.

On Saturday evening, January the 19th, 1833, I was summoned to attend William Mills, aged 10, living at Boughton, two miles from Upton. When I arrived, his parents informed me that their son had shot himself, with a gun made out of the handle of a telescope toasting-fork. To form the breach of the gun, he had driven a plug of wood, about three inches in length, into the handle of the fork. The touch-hole of the gun was made after the charge of powder had been deposited in the hollow part of the handle. The consequence was that, when the gunpowder exploded, it forced the artificial breach, or piece of stick, from the barrel part of the gun, with such violence, that it entered the thorax of the boy, on the right side, between the third and fourth ribs, and disappeared. Immediately after the accident, the boy walked home, a distance of about forty yards.

By the time I saw him, he had lost a considerable quantity of blood, and appeared very faint; when I turned him on his right side, a stream of venous

blood issued from the orifice, through which the stick entered the thorax. Several hours elapsed before any degree of re-action took place. He complained of no pain.

For the first ten days or a fortnight after the accident, he appeared to be recovering, and once, during that time, walked into his garden, and back, a distance of about eighty yards; and whilst there, he amused himself with his flowers, and even stirred the mould. He always said he was well, and was often cheerful, and even merry. There was no peculiar expression of countenance, excepting that his eyes were rather too bright.

After the first fortnight he visibly emaciated, and had frequent rigors, which were always followed by faintness. The pulse was very quick. There was no cough nor spitting of blood. The secretions were healthy. He had no pain throughout his illness.

He died on the evening of the 25th of February, exactly five weeks and two days after the accident occurred. At the examination of the body there were present, the Hon. W. H. Coventry, Mr. Walker, the father of the boy, Mr. Sheward, surgeon, and myself.

On opening the thorax, a small cicatrix was visible between the cartilages of the third and fourth ribs, on the right side, about half an inch from the sternum.

There was no effusion of blood, or of serum, into the sacs of the pleura.

The lungs appeared quite healthy, excepting that there was a small tubercle in the right lung, and at its root, near to the pulmonary artery, a small

blue mark in the cellular tissue, corresponding, in size, with the cicatrix on the parietes of the chest.

Heart and pericardium.—When the pericardium was divided, about half an ounce of serum was found in it.

The heart, externally, appeared healthy.

When an incision was made into the heart, so as to expose the right auricle and ventricle, we were astonished to find, lodged in that ventricle, the stick which the boy had used as the breach of the gun, the one end of it pressing against the extreme part of the ventricle, near the apex of the heart, and forcing itself between the *columnæ carneæ* and the internal surface of the heart; the other end resting upon the auriculo-ventricular valve, and tearing part of its delicate structure, and being itself encrusted with a thick coagulum, as large as a walnut.

We searched, in vain, for any wound, either in the heart itself, or in the pericardium, by which the stick could have found its way into the ventricle.

Observations.—This case strikes me as one of the most interesting on record. In the first place, that this child should have survived such an accident, as the lodgement of a stick, three inches in length, in the right ventricle, and have been afterwards equal to so much muscular exertion as he was, appears wonderful, especially if we consider the mechanical difficulty which the heart had thereby to encounter in carrying on the circulation of the blood.

In the next place, it appears somewhat difficult to point out, how the stick found its way into the right ventricle of the heart. There was no wound, nor remnant of a wound, either in the pericardium, or

in the muscular structure of the heart. The stick seems to have entered the mediastinum, without wounding the anterior part of the right lung, but to have wounded the posterior portion of the lung, near its root. What became of the stick afterwards is uncertain, excepting that we know it found its way into the heart.

I am inclined, myself, to think, that the stick, after wounding the lung, passed into the vena cava, and was carried by the stream of blood, first into the right auricle, and then into the right ventricle, where it became fixed, in the manner before specified, and as is shewn in the accompanying plate.

EXPLANATION OF THE PLATE.

a.—The right auricle.

b.—The right ventricle.

c.—The stick, the one end of it embedded in the columnæ carneæ, near the apex of the heart, the other end resting upon the auriculo-ventricular valve, and rupturing it.

d.—The stick, represented of its real size, as it appeared when removed from the heart.

A Ducotés Lithog. 70 St. Martins Lane London

ON DISLOCATION OF THE SHOULDER.

BY W. F. MORGAN,

Late House Surgeon to the Bristol Infirmary.

When it has happened to any individual to obtain the knowledge of a more simple and successful mode of treating accidents or diseases of common occurrence, I think it is his duty to communicate it to the public. It is also a gratifying privilege to be made, in any measure, instrumental in adding to the resources of a profession, whose high and noble object is the alleviation of human suffering. On this account I am desirous of recommending to the notice of the Association, the method which is practised at the Bristol Infirmary, for the reduction of dislocations of the shoulder; and the few remarks I have to offer, will form an Appendix to the practical and valuable little paper, on the same subject, by Mr. Toogood, in the first volume of the Transactions.

Much has been written by many eminent men, on the nature and treatment of this very common accident, and yet it appears that considerable difficulty is often experienced in the management of it, and severe measures are not unfrequently proposed and resorted to, almost as a matter of course. The plan I am about to mention, claims no merit for its

novelty, as the principle of it has long been known; but I am not aware that it has been adopted, to any extent, or thought so highly of, as its success certainly deserves. It has invariably succeeded in all cases of recent dislocation, of every kind, occurring within my own experience, during my connexion with the infirmary as pupil and house-surgeon, comprising, at least, 150 instances; and, I believe, the testimony of previous years is equally favourable, so that it has, for a long time, been the only plan had recourse to; and even the pupils manage this accident with the greatest facility. The following is a description of it.

As soon as the patient is seen, and the nature of his injury ascertained, he is placed sideways on a common chair, with the dislocated arm hanging over its back, which is padded for the reception and support of the axilla. A reel-towel is then fastened on the arm, immediately above the condyles, by a running noose, with the knot outwards; and its lower part is formed into a loop some way above the ground, to receive the foot of the surgeon. One or two assistants press on the shoulder, much in the same way as Mr. Toogood advises, to fix the scapula and prevent the patient from rising, and the surgeon puts his foot, or, occasionally, his knee, into the loop of the towel, and gradually and unremittingly bears on it with the whole weight of his body. In a very little time, generally within three or four minutes, the head of the bone slips into its place with an audible jerk; the patient's sufferings are moderate, and of short duration, and the use of his arm is soon restored.

In dislocations of long standing, of course other and more powerful means are requisite; but, in several of the cases to which I have alluded, many hours, and, even, days had elapsed before the patients applied for relief. I have, likewise, notes of the case of a strong and muscular man, who was admitted with a dislocation of the shoulder, complicated with fracture of the humerus at its middle, in whom the reduction was effected as readily as usual, by binding up the arm with splints, and applying the towel on the outside of them.

A DESCRIPTION OF THE ANATOMICAL STRUCTURE

OF THE

LIVER OF A RAT, FROM CUBA.

(WITH A PLATE.)

BY HENRY RILEY, M. D.

Senior Physician to St. Peter's Hospital, and Lecturer on Anatomy, Bristol.

HAVING lately had an opportunity of examining the liver of a rat from Cuba, which has been described as a new species by Desmarest, and noticed by Mons. De Blainville, in his lectures at the Sorbonne, I trust that the annexed drawing of one of its lobes, accompanied with a short explanatory notice, will enable the Association to form a pretty accurate idea of so singular a modification of an organ, which itself presents an anatomical analysis, unaided by the scalpel.

This liver, made up of a multitude of little grains, formed by the sanguineous, nervous, and lymphatic systems, and the bile vessels, consists of five lobes, as occurs in other gnawers; each lobe is subdivided into an immense number of small lobules or grains, which give to the organ an appearance somewhat like that of a bunch of grapes. These granules are separate and free on all sides but the one that

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connects them with the vessels, (the hepatic and portal veins,) along whose course they are placed; these vessels and the serous membrane, connect and hold the grains together, so that it may be said that this organ has no parenchyma. It is easy to trace the portal and hepatic veins, dividing into the same number of branches as there are lobes, whilst the smaller ramifications terminate in the lobules themselves.

The lobules are covered, externally, by serous membrane, excepting where they are connected with the vessels, as before mentioned.

Internally each grain or lobule is a hollow cell, subdivided by septa into several smaller ones, but freely communicating with each other; this is made very evident by inflation. These cells are lined, internally, with a very thin membrane, similar to, and continuous with, that of the veins. Between their external and internal membranes, are the branches of the hepatic artery, the lymphatic and gall vessels, and nerves ramifying in cellular tissue.

These cells are placed at the periphery of the two venous systems, since the small branches of each terminate directly in them. If the vena porta be blown into, the air passes, with the utmost facility, into the hepatic veins, and *vice versa;* and the cells of the lobules are distended and inflated with as much ease as when air is forced into a lung through the bronchia.

The hepatic artery, of the ordinary proportions, is distributed to the parietes of the lobules. The lymphatic and nervous systems have a like arrangement. So far as my means of observation could

allow me to form an opinion, the gall vessels arise in the parietes of the lobules, but do not differ, in their after-course, from those of other rats.

From the foregoing considerations, I conceive we are justified in concluding,—

1st. That as the crypt may be considered as glandular structure in its most simple form, the present is an instance of that character presenting itself, in an organ hitherto the most difficult of explanation on that ground.

2ndly. In comparing this organ with the alimentary canal, we should consider the portal and hepatic veins, continuous with each other, as representing the canal itself; the hepatic artery, the mesenteric arteries, and the gall and lymphatic vessels as representing the lacteals and the thoracic duct. The gall would correspond to the chyle.

3rdly. That, on comparison with the lungs, the vena porta would represent the pulmonary artery; the hepatic veins, the pulmonary veins; the hepatic artery, the bronchial; the gall ducts, the trachea; the only difference being the presence of atmospheric air in the latter.

4thly. In comparing the opinion of Malpighi, that at the termination of the vessels which bring the blood, and at the commencement of those which convey the secretion, there are small intervening vesicles; with *that* of Ruysch, that these vesicles are nothing more than undeveloped vascular ramifications, the terminations of the blood vessels continuing, without interruption, into the origin of the secretory vessels, I conceive that the hypothesis of

Malpighi acquires additional probability, from the preceding details.

REFERENCES TO FIGURES.

No. 1.—*a.*—Gall bladder.
b.—Cystic duct.
c.—Hepatic duct.
d.—Vena porta, slit open.
e. e.—Lobules.

No. 2.—Shewing the arrangement of the lobules along the branches of the veins, and their connection with the serous membrane.

OBSERVATIONS UPON CHOLERA,

AS IT APPEARED IN

WOLVERHAMPTON AND ITS NEIGHBOURHOOD,

IN AUGUST, SEPTEMBER, AND OCTOBER, 1832.

BY T. OGIER WARD, M. B. OXON,

Physician to the Dispensaries of Wolverhampton and Lichfield.

In preparing these observations for insertion in the Transactions of the Association, I have endeavoured to confine myself to a simple statement of facts; considering the persons for whom I write, fully as competent as myself to draw inferences from them. Where, however, I have been induced to transgress this rule, I hope it will be found that the conclusions to which I have come, are as logical and exact as the difficult subject I am treating will admit.

In order to proceed more concisely, I have arranged all I have to say upon the subject of cholera, under separate heads, and have formed tables of the daily progress and treatment of the disease.

Origin.—Very soon after the appearance of cholera in England, boards of health were formed in Wolverhampton and the neighbouring towns; and public attention was so much directed to the probability of the early approach of the disease, that it

is impossible that any cases could have occurred unnoticed, previously to the dates I am going to mention. On the contrary, the different boards, and the medical men, were frequently alarmed by reports of the existence of cholera, which were either altogether false, or proved to be mere cases of bowel complaints. The first real cases occurred at Dudley, to some travelling German broom-sellers, two of whom died, a third recovered, and the rest of the party were removed from the town. From this time, which was, I believe, early in June, there were no more cases heard of till, towards the latter end of the month, when a boatman, on his way from Manchester to Wolverhampton, was attacked by cholera, and died in his boat, about four miles from the latter place. The boat was immediately sunk. About this time a man died in Brick-kiln-street, Wolverhampton, of what Dr. J. Johnstone, who saw him, considered to be English cholera; and several similar, but not fatal, cases occurred in the villages round, in June and July. In the first week in July, a boatman died of decided cholera, at Tipton, just after his return from Liverpool, where the disease prevailed; and several of his family were attacked after his arrival. The disease continued to spread with rapidity at Tipton, till the 13th of July, and the next day it broke out at Dudley, which is within two miles. In a few days there were many cases in the parishes of Brierley Hill, Kingswinford, and in the district called the Level, all lying round Dudley. On the 4th of August the first case occurred at Bilston; and on the same day a suspicious case was observed between that place and Wolverhampton.

In Bilston the progress was so rapid, that by the 8th there were seventy cases, and twenty-two deaths. Early in the morning of this day, a young man, and an old woman, a dealer in rags, &c., who had been out the day before, the one to Bilston, the other drinking in Dudley, were attacked, simultaneously, in a lodging-house in North-street, Wolverhampton. The man died the same night, the woman the next day; both presenting the most perfect specimens of the collapsed state. The next case was an iron-founder, many of whose fellow workmen lived in Bilston, and had the disease: then, a boy, who had been wandering about the country for work, was taken ill and died, in a lodging house, in Canal-street; and, the next day, two more of the iron-founders were seized; all these died but one. Till after the races on the 12th, 13th and 14th of August, very few cases were observed, except in those parts of the town where the iron-founders lived; but then the disease became more general, though it still preserved its violence in its first situation.

Progress.—The progress of the cholera in Wolverhampton, with regard to the numbers attacked, will be seen by the table of cases; but as to its advance from one place to another, it is worth remarking, that though there might, previously, be scattered cases in a street or row of houses, yet, where the disease prevailed extensively, the main body, if I may use the expression, proceeded from house to house with considerable regularity. This was particularly observable in part of the district under my care, the cholera first breaking out in that part of Ettingshall Lane nearest to Bilston, and thence

advancing down the lane, so that the people at the end nearest to Wolverhampton, were continually asking me when I thought it would reach them. In its disappearance it seemed to follow the same law, new cases very rarely occurring where the disease had previously been rife. It will be seen, by the table, how great was the influence of the dispensary for bowel complaints, established at the suggestion of Dr. Macann, in checking the progress of the cholera; and, though the numbers rose again from the 6th of September to the 12th, yet I think this may be fairly attributed to the state of the weather, which was very fine and hot at this time; particularly as a similar increase of cases occurred in Worcester and London in the same week; the cases at Worcester being 9, and the deaths in London 100, more than in the preceding week.

Table of cases of Diarrhœa, Cholera, and of Deaths, in Wolverhampton, from August 8th to October 7th, 1832, inclusive.

Date.	*Diarrhœa.*	*Cholera.*	*Deaths.*
Wednesday, August 8,	0	2	1
Thursday, ... 9,	0	0	1
Friday, ... 10,	0	1	1
Saturday, ... 11,	0	3	2
Sunday, ... 12,	0	4	1
Monday, ... 13,	Races.	3	0
Tuesday, ... 14,		2	0
Wednesday, ... 15,		3	0
Thursday, ... 16,	0	2	1
Friday, ... 17,	0	19	3
Saturday, ... 18,	0	23	7
Sunday, ... 19,	0	13	1
Monday, ... 20,	0	6	3
Tuesday, ... 21,	0	7	3
Wednesday, ... 22,	0	16	4
Thursday, ... 23,	0	16	9
Friday, ... 24,	0	23	5
Saturday, ... 25,	0	21	9
Sunday, ... 26,	0	20	2

Date.	*Diarrhœa.*	*Cholera.*	*Deaths.*
Monday, ... 27,	0	17	5
Tuesday, ... 28,	21	30	4
Wednesday, ... 29,	53	12	2
Thursday, ... 30,	23	19	4
Friday, ... 31,	43	16	2
Saturday, September 1,	38	16	6
Sunday, ... 2,	22	21	7
Monday, ... 3,	50	9	4
Tuesday, ... 4,	47	14	5
Wednesday, ... 5,	45	8	6
Thursday, ... 6,	44	14	5
Friday, ... 7,	32	15	10
Saturday, ... 8,	32	18	1
Sunday, ... 9,	24	21	6
Monday, ... 10,	67	21	10
Tuesday, ... 11,	46	21	4
Wednesday, ... 12,	40	12	6
Thursday, ... 13,	37	12	6
Friday, ... 14,	38	9	5
Saturday, ... 15,	36	2	2
Sunday, ... 16,	20	8	1
Monday, ... 17,	47	8	3
Tuesday, ... 18,	30	2	0
Wednesday, ... 19,	34	2	0
Thursday, ... 20,	24	10	4
Friday, ... 21,	38	7	3
Saturday, ... 22,	50	3	1
Sunday, ... 23,	24	11	3
Monday, ... 24,	64	2	6
Tuesday, ... 25,	52	4	5
Wednesday, ... 26,	87	4	2
Thursday, ... 27,	70	2	2
Friday, ... 28,	60	0	0
Saturday, ... 29,	31	0	0
Sunday, ... 30,	20	1	0
Monday, October ... 1,	53	3	2
Tuesday, ... 2,	37	0	0
Wednesday, ... 3,	38	1	0
Thursday, ... 4,	30	0	0
Friday, ... 5,	32	0	0
Saturday, ... 6,	30	0	0
Sunday, ... 7,	32	0	0
60 Days.	1641	559	183

The dispensary for bowel complaints continued open till the beginning of November, when there were about ten applications daily. The number of diarrhœa cases was always increased on the Mondays,

both from the people not liking to apply for relief on the Sunday, and from their eating large quantities of fruit, which they purchased at the Saturdays market, and which they would give their children even when suffering both from diarrhœa and cholera. Three fatal cases of cholera, which were not seen by any medical man, occurred, at intervals, in the same house, before the middle of October; and an imported case from Madeley fell under my care, as late as the 23rd of November, which was the last in the township of Wolverhampton. The whole number of cholera cases reported, was 578; of deaths 193, being exactly one-third. This proportion of deaths is, I am convinced, too high, both from reading the returns from other places. and from conversations I have had with persons who have seen a great deal of the disease, from whom I learn that the collapsed cases were generally fatal; but, by the desire of Dr. Macann, few cases were reported as cholera, in Wolverhampton, in which there was not more or less collapse; and most of the diarrhœa cases were attended with vomiting; indeed, many proved to be merely the first stage of the most malignant cholera. The number of men was 220; of women, 219; of those under puberty, 139; of whom there died, respectively, men 73; women 72; under puberty, 38, according to the table. These last were comparatively fewer than in other places, in proportion to the deaths of adults. One out of forty of the inhabitants was attacked. The number of families in which more than one had the disease, was about forty. The cases under my care were 104, of whom 27 died.

Causes.—From the manner in which the disease originated, and continued its progress through the mining district, I think it evident that it had contagion for its primary cause; but, as I do not wish to enter into all the arguments which may be used in support of my opinion, which, I must own, was formed before I had seen a single case of cholera, I shall only state such circumstances as, occurring in Wolverhampton under my own observation, induce me to hold more strongly to my first idea of its nature. I have already pointed out the increase in the number of cases, almost immediately after the races; and, I may add, that several persons were affected, at this time, in the surrounding villages, of whom no return was made. Of the nine medical men to whom the charge of the several districts of the town was given, by the Board of Health, five suffered severely from diarrhœa, attended with more or less sickness; and of five nurses in the cholera hospital, three took the disease, and one died. Lastly, in no case, where I made enquiry, did I fail to trace some communication between the sufferer and some other persons who had the disease, either by living in the same house, sleeping together, nursing them, washing their clothes and bedding, or attending their funerals.

The habits and state of mind of the patients, and the locality of their houses, appeared to have great effect as exciting causes, and to exercise very considerable influence upon the violence of the disease. Thus, the iron-founders were almost the first attacked, and they suffered more than any other class of men. They reside in neat cottages, in tolerably

healthy situations, near the works, in the out-skirts of the town; but they work for twelve hours together, exposed to the heat of the furnaces; and when this is no longer endurable, they rush into the open air, reeking with perspiration, and drink largely of cold water. Their wages are good, and they live better than the locksmiths and other mechanics; and though not, generally, long lived, they are, upon the whole, a healthy class of men. The cholera prevailed to such an extent among these men, that there were few houses in which one or more persons were not attacked, and so many of them died, that the works were closed, partly from want of hands, and also to prevent the further extension of the disease among them. In another part of the town was a row of twenty-three houses, inhabited by many families of dissolute character, in the whole of which there were only two beds and one bedstead; here the disease was spreading with fearful rapidity, when it was almost entirely stopped by completely emptying the houses, exploding gunpowder in every room, and afterwards whitewashing them. It was in one of these houses that a man, having diarrhœa, slept with a healthy girl, in a bed in which a person had died of cholera: they were both attacked while in bed, or soon after rising, and were carried to the hospital, with decided cholera: the girl died, the man recovered. This, by the way, is a complete answer, with many other similar cases, to Magendie's assertion, that the generative functions ceased during the prevalence of cholera in a town.

A striking instance of the effects of bad food and dirty habits, was shewn in a family of eight persons. The father was in the habit of receiving from the butchers, offal and unsaleable meat, which was hung up in the house for the family to help themselves from till it was consumed, or too putrid to be eaten. The habits of the family were also dissolute and dirty, and, consequently, the house was a nuisance to the neighbours. The wife was the first taken ill, and she died; and it was with great difficulty her funeral was hastened, from the opposition of the husband, who swore most positively that she had not died of cholera, and should not be buried before the usual time; and by way of bravado, he went and lay down by the body. Two days afterwards he was seized with the disease, and taken to the hospital; and the family was dispersed about the town; nevertheless, they all had cholera in a few days, and only one, besides the father, survived.

The influence of an unhealthy situation was exhibited strongly in Darlington-street, and a lane called the Caribee island, which is a filthy narrow alley or *cul de sac,* inhabited chiefly by the lowest Irish, with an open stagnant ditch down the middle. Here the cases were very numerous and fatal. Darlington-street is a wide, airy street, consisting of two rows of houses at its upper end, nearest the centre of the town, but of only one at the lower part, where it is a raised causeway, open on one side to the gardens and meadows beyond. The lower rooms of the houses being below the level of the street, are, consequently, very damp; and within

a few yards of the backs of these houses, runs a wide ditch, the main sewer of that side of the town, which is dammed up and diverted into several large cesspools, or receptacles for the mud and filth which it deposits. These, in warm weather, emit such offensive exhalations, as to be almost intolerable to the persons who live near them. The danger likely to arise from the state of these cesspools, having been represented to their owners, quick lime was sprinkled over the surface of the mud; but this, unfortunately, failed in its effect of preventing, though it might have had some power in checking, the progress of the cholera in that street. It is singular, that this was the only part of the town in which persons in easy circumstances took the disease. The individuals attacked were, a lady, her nurse, her eldest daughter and son, and her second son and daughter; an elderly lady, in the next house; another, in the upper part of the street; and a child, next to the last house. Eight of these nine persons had every comfort and aid their state required, but only three, viz. the eldest daughter and second son, and the child, recovered.

Though carelessness and indifference did not always secure an immunity from the disease, yet there were many instances where the contrary feelings of terror and anxiety seemed to predispose the patients to its attacks, and rendered them less able to contend against it; at least, almost every case in which such feelings were marked, proved fatal. We had several cases where persons were attacked immediately after a fit of drunkenness: one case, in particular, is worth mentioning. A man was found in

the street, late at night, declaring that he had the cholera, and earnestly entreating that he might be sent to the hospital. Thither he was taken, but without any order from a medical man for his admission. In the morning, when he came to himself, and saw where he was, he became alarmed, and as anxious to quit the place, as he had been to enter it. As he declared he had no complaint, and presented no symptoms, he was discharged. That very day he was seized with cholera, and died at night. Almost all the male patients were iron-founders, colliers, boat-men, or labourers. What the circumstances were under which they were affected, I know not, but several of the hangers-on of the dispensary, or malingerers, were taken off by the cholera; and the number of other patients was very much diminished during the whole course of the disease, and, for some time afterwards, every other complaint being masked by the prevalence of diarrhœa, of which, from first to last, there must have been at least three thousand cases.

The influence of age upon the rate of mortality, and course of the symptoms, was more particularly observable in the poor-house, where many persons were attacked in extreme old age. In them, not only was there no violent purging, vomiting, nor cramps, to waste the strength, but these symptoms, even in a mild form, were sometimes entirely absent, while the patients, complaining only of thirst and burning at the stomach, appeared gradually to grow weaker, their pulse to become more rapid and feeble, their limbs blue and cold, and their voice extinct. Thus, they quietly expired, forming perfect illustra-

tions of Magendie's description of cholera: "A disease beginning where others end, in death." Of fifty-one cases, of the age of sixty and upwards, only nineteen, or two-fifths, recovered; while of persons under puberty, the proportion of recoveries was nearly three-fourths; and of adults, two-thirds. The fifty-one cases were the whole number of persons, of that age, attacked within the township of Wolverhampton, including the poor-house.

Symptoms.—As my time was too much occupied to admit of my taking notes of individual cases, I can only give a general account of the symptoms I observed. In a few cases there were no premonitory symptoms, but the patients were struck down, as it were, at once; and these were the most rapid and fatal cases, death occurring in from five to nine hours after the invasion of the disease. Some few persons felt a general depression and uneasiness; but by far the major part laboured under diarrhœa, for about two days previously to the decided attack. This diarrhœa was most usually unattended by pain, and excited so little feeling of illness, that, till the patients saw the danger of neglecting it, they could not be induced to apply for relief. The stools were natural at first, but gradually became more fluid and frequent, ceasing, at the same time, to exhibit any tinge of bile, and assuming the appearance of gruel or serum, with flakes of lymph. When the stools had ceased to contain any bile, the state of prostration generally commenced. In a few cases I observed an oily matter, mixed with a thick gruel-like scum, floating on the top of the serous fluid. I am sorry I did not ascertain in these cases, whether

the patients had taken castor oil, but I believe not, as brandy and herb teas were the remedies most in use among the poor. In most of the cases reported of the discharge of fatty matter from the bowels, there appears to have been, at the same time, considerable derangement of the liver, so as to interfere with the proper secretion of bile. I think, therefore, that this observation of mine, if correct (and if so, it will, doubtless, be confirmed by others) may tend to throw some light upon the uses of the bile, and upon the pathology of the liver, in cholera. In the fatal cases of cholera, the stools retained this gruelly appearance to the last; but, in the progress towards recovery, the flakes and gruelly matter became more and more tinged with bile of a yellow colour, and the evacuations more consistent, till they resumed their natural state. If, however, castor oil had been given, the stools, most usually, changed suddenly to a deep green colour, and became of the consistence of thin mud, whether the patient lived or died. The stools restored the blue colour to litmus paper slightly reddened. Many patients passed lumbrici, after taking castor oil. I never heard any patient complain of tenesmus. One patient, who had taken several doses of castor oil, in the collapsed stage, with the usual result, died, in the stage of fever, after five days obstinate constipation.

Vomiting.—The occurrence of this symptom was not so universal as the purging, and however violent it might have been, it generally ceased some time before death. The matter vomited resembled the stools.

The patients had a peculiar smell, not like the earthy smell of a person near expiring, but like that of boiled milk.

The blueness varied greatly in intensity and situation, and disappeared from many at the moment of death.

The skin of some was dry, but, in most cases, cold, moist and viscid, and shrivelled, like a washerwoman's hand, in all.

The eyes were universally sunk, and surrounded by a dark area. In some, this took place suddenly, upon the invasion of the disease; and they returned to their natural state as suddenly, upon its cessation; thus proving, that this symptom is not produced by the absorption of the fat of the orbit, but that it is, probably, merely the result of the general shrinking of the body, though more remarkable here from its situation. The conjunctiva presented, before death, that glazed, dry, blood-shot appearance, described by Magendie.

The general state of mind was very remarkable, for, however alarmed the patients might be before the attack, I never observed a person, suffering from cholera, in the slightest degree influenced by the fear of death, by grief at the idea of parting from their relatives and friends, or by the hope of recovery. On the contrary, they seemed in a state of perfect indifference on all these subjects, though their friends were weeping round their beds. Even the children did not cry, but were only restless and troublesome. The lighting up of the mental faculties, described by Sir H. Halford, as occurring just before death, in certain diseases, has been ascribed, by a late writer,

to the intoxicating effect, as it were, of the carbonized blood stagnating in the cerebral capillaries. Again, Magendie and others have adduced the integrity of the mental powers to the last in cholera, as an anomaly, or, rather, as an argument against Bichat's opinion of the poisonous properties of venous blood. As far as my observation extends, however, I have remarked that, besides indifference, there has been, before death, more or less stupor, attended with deafness, and alternating, in some cases, with jactitation and muttering. The conclusion I draw is, that black or venous blood has not only no power to augment, or, even, maintain the sensorial faculties, but that it has a direct effect to lessen and oppress them.

The voice was generally lost; some, however, retained it, though hoarse.

The tongue was cold and moist, with a cream-like fur; rarely dry and brown. There was an intense and urgent thirst for cold water, which was not given unless it contained Dr. Stevens' powders, as it was found to increase the vomiting. When Dr. Shute had published his mode of treatment, water was allowed to the patients, but the quantities drank were not enormous, and some took but little. This thirst, I imagine, might be partly owing to the burning in the epigastrium, as well as to the general loss of fluids, for almost all asked for water, and when questioned, but not otherwise, complained of heat at the stomach; indeed, I never heard any complain at all, either adults or children. Perhaps this heat at the stomach might be the reason that, when left to themselves, the patients sought out the coolest

parts of the house to sit in ; and, if in bed, that they threw off the bed-clothes, even when cold and pulseless.

The strength was much reduced, but many, when quite blue, cold, and pulseless, would get out of bed to the chamber pot ; and children, in the same state, would walk about, or even go down to the streams for water to drink. Almost all the water in the district under my care, and, generally, near the pits, is pumped up, by the steam-engines, into reservoirs, from whence it runs by various streams ; and the wells are nothing more than holes made close to the side of the stream, for the water to settle and deposit its mud in. Of course, in rainy weather, the water is exceedingly impure. The wells being drained by the pits, the use of this water is common throughout the mining district ; but I cannot say whether it had any influence in causing a greater prevalence of cholera.

No spasms were observed in children, nor could I perceive that the presence or absence of them was the more favourable sign in adults ; in fact, they seemed to have no influence upon the termination of the disease, and always ceased before death.

The respiration was rather laborious and accelerated, but presented no peculiar characters.

The pulse gradually became smaller and more frequent, as the disease advanced, till it ceased to be felt. It varied from 90 to 120 per minute.

The blood, when drawn, was thick, syrupy, and of a blueish black ; the drops on the floor turning florid, that in the basin continuing darker than healthy blood. Sometimes it was cupped and buffed,

and the coagulum was firm with little serum, and that greenish ; but, generally, there was no separation, or only a slight one, into clot and serum. When, by dint of rubbing the arm, about half a pint of this black blood had been drawn, the next portion was usually of a much more florid colour, and flowed in a pretty good stream.

A few patients continued to pass small quantities of urine, to the last; and many thought they did so, deceived by the fluidity of their stools.

An erythematous eruption, consisting of elevations of the cutis, red and tingling like flea-bites, about a third of an inch in diameter, and more or less confluent, occupied the arms and chests of a few patients in the secondary fever ; but the course of the disease was not at all affected by it, neither a remission nor exacerbation of the symptoms being thereby produced.

There were some cases of relapse, but none of them, as far as can I learn, after perfect recovery ; some diarrhœa being always left after the first attack. The relapsed cases were not more fatal than the others.

The recovery, with many, was almost immediate, so that they returned to their work in a day or two ; but the generality were much longer in regaining their strength, though not usually more than a fortnight. Some, however, have told me now, after the interval of a year, that they have never been in good health since. On the whole, I think they recovered faster than in other diseases, attended with an apparently equal loss of strength.

The time allowed between the death and burial, was far too short to admit of any post-mortem examinations.

Two well authenticated cases of motion of the limbs after death, occurred at Tipton; but I cannot say that I ever witnessed anything of the kind. In fact, I saw very few dead bodies, my time being too much occupied with the living, to allow me to watch the dead. The case of the woman at Dudley, who recovered, in some degree, after being laid out for dead, has been already laid before the public through the medium of the newspapers.

The following table is a summary of the treatment of 356 cases of cholera, with the number and proportion of deaths. It must be understood that very few of the patients were treated upon one plan alone, but I think the general routine was nearly this, viz. bleeding or emetics, calomel, with or without opium, every two hours; salines to drink, and croton oil, if the symptoms still continued.

REMEDIES.

	Bleeding.	*Emet.*	*Calomel.*	*Opium.*	*Salines.*	*Croton Oil*
No. of Cases, ...	166	89	171	139	233	111
Do. Deaths,.....	44	29	43	35	61	34
Proportion of do.	4-15 Nearly.	1-3	1-4 Nearly.	1-4	1-4 Rather more.	1-3 Nearly.

	Stimul.	*Laxatives*	*Astrin.*	*Cold Wat.*
No. of Cases, ...	36	35	35	15
Do. Deaths,.....	11	6	6	8
Proportion of do.	1-3	1-6	1-6	1-2

Total number of deaths, where treatment is recorded, 106

Bleeding.—I believe that venesection did not form, in any case, the sole remedy, but the treatment

usually began with it, and if the blood did not flow freely, recourse was had to emetics, which generally produced a more abundant stream. Frequently the patients rallied, perfectly, after losing blood; the medicines administered afterwards, were given merely to assist the re-action, and restore the secretions to a natural state; but, in most instances, the re-action was but temporary, the pulse again becoming feeble, the skin cold, and the vomiting returning. Nevertheless, though many of these cases proved fatal in the end, yet the relapse was slower in its progress than the original attack, and seemed to be more under the influence of medicine. Upon the whole, the opinions of medical men are in favour of blood-letting; and I am a decided advocate for it in any stage of the disease in which it can be accomplished, except the febrile—but particularly at the commencement. In a few instances it was repeated with the happiest result. It was, sometimes, necessary to open two or three veins at once, and, by this means, a quantity of blood was drawn, which it was almost impossible otherwise to procure. Very few children were bled, as their skin presented no veins sufficiently large.

Emetics.—The statement of cases, as shewn by the table, in which emetics were given, is not nearly equal to the real number. Often when bleeding was inadmissible, emetics succeeded in producing re-action; but in no case were they relied on, to the exclusion of other remedies. Vomiting appeared to me the most formidable of the whole train of active symptoms, and, therefore, of the first importance to be allayed. On this account, no liquids, except

medicines, were allowed to the patients, for it was observed, that they were rejected as soon as taken, and produced most exhausting retching, and attempts to vomit. Emetics, on the contrary, when followed up with large draughts of water, caused copious but easy vomiting, during which, re-action often took place, and was succeeded, for a time, by a quiet state of the stomach. If, however, they were given when the patients were sunk into that state of quiet or stupor which preceded death by a few hours, they seemed to hasten the fatal event, by exhausting the remaining strength, in ineffectual attempts to vomit, and in inducing something like convulsions, in which I had the regret to see one patient expire. I should certainly, had I again occasion to treat a case of cholera, confine the use of emetics to the period during which the strength of the patient appears able to support their effects.

Calomel.—With regard to calomel and the other forms of mercury, I believe they were employed almost solely under the idea that they possessed the power of restoring the secretion, or, rather, the flow of bile. But, not to enter upon the question, whether there be a want of secretion in the liver, or merely a spasm of the gall duct, I cannot say, from my own experience, that I ever saw a case of cholera, in which the return of bilious evacuations appeared to be the result of the employment of mercury ; nor, except in one case, (a doubtful one,) did it ever produce salivation, though I gave calomel to the extent of nearly a drachm daily, in many instances. How, then, shall we judge of the powers of a medicine in cholera, which ceases to produce those peculiar effects which,

in other diseases, are considered as the tests of its utility? I have examined the reports sent to the Central Board, as given in the Medical Gazette, and though I find that most practitioners recommend calomel in the early stages, yet, with one exception, they trust to other means when the collapse has set in. Again, some give it in very large, others in small doses, so that, as they rarely trust to this remedy alone, its powers may very reasonably be doubted; moreover Dr. Stevens, Dr. Shute, and others, who recommend peculiar plans of treatment, omit mercury altogether. In a recent answer to some queries I inserted in the Medical Gazette, I find the writer coincides with me in thinking it useless in any doses, during collapse, and, even, after re-action had begun; he observes that its effects, viz. the restoration of absorption and secretion, were not produced in less than from twelve to sixty hours, which is about the period before re-action becomes fully developed, in ordinary cases, where no mercury has been exhibited. Trusting to the reports from the North, in its favour, we were led to consider calomel and opium, combined, as our sheet anchor, and, therefore, it was used very extensively at first; but, after a time, we began to omit the latter, and, in consequence, there were not more than 50, of the 171, cases reported, in which calomel was used uncombined with opium.

Opium.—Except at the commencement of the vomiting and purging, I have no confidence in opium, and I believe the same opinion prevails among the other medical men of the neighbourhood. A gentleman, in very extensive practice, in Bilston,

told me that, before the cholera appeared there, he thought the doses of opium had not been sufficiently large. He, therefore, gave it very extensively, at first, in order, as he said, to knock down the disease, but with so little effect, that he soon relinquished the use of it, and trusted to Dr. Stevens' salines. In these cases the opium, like the calomel, seemed to have lost its usual properties, except in one or two instances, where there was a tendency to coma; but this was as often the effect of the disease where no opium had been given.

Salines.—The number of cases (333) in which Dr. Stevens' salines were given, is sufficient proof of the estimation in which this remedy was held among us, and, I believe, the same high opinion of its efficacy still prevails. As there was some difficulty to induce the patients to take them regularly, as a medicine, I generally mixed a quantity of the powders in water, and directed that it should be the sole drink of the patient. This mixture I found remained longer on the stomach than any other liquid taken in equal quantity, while it had also the effect of relieving the intense thirst. It will be observed that the proportion of deaths, under this treatment, is only a fourth of the cases.

Croton Oil.—Further experience has confirmed my opinion of the superior efficacy of croton oil over every other medicine in the stage of collapse; and, I may add that, in the medical returns, though some practitioners state that they have not more reliance upon it than upon other remedies, still many speak of it in the highest terms, and none decry it. The reason that the deaths (34) bear so high a proportion to the

cases, (111) is this, that it was given to many as a last resource; and yet in almost no case did it fail to produce its usual effect upon the liver. In the last case that occurred, after Dr. Elliotson's plan of prussic acid and calomel had been persevered in, for two days in vain, two doses of the oil produced the green stools in seven hours after the first dose was given, and just before death.

Stimulants.—These, except ammonia, were soon relinquished, from their inutility and liability to abuse.

Laxatives and Astringents.—These were so little used, except at the beginning and close of the attack, that no opinion can be formed from the returns.

Cold Water.—I was the first in this neighbourhood to try Dr. Shute's plan, and I was very much pleased by the result, in one instance, for I had considered the patient to be too far gone for even croton oil to be of service. She drank about three pints of cold water during the night, and re-action had taken place by the morning. Other medical men then tried this plan, but it was soon given up, being found even less beneficial than any other treatment, as the returns shew, 15 cases, 8 deaths.

Venous injection was tried twice, and Dr. Elliotson's plan once, in all without effect.

So many difficulties surround the pathology of cholera, that I shall not enter upon it.

SOME OBSERVATIONS

ON THE PECULIARITIES OF DISEASES

OF

INFANTS AND CHILDREN.

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[CONTINUED FROM VOL. I. P. 73.]

I ENDEAVOURED, in a former paper, to explain some of the anatomical and physiological peculiarities of the animal economy, which distinguish the infant from the adult state, and to shew the modifying influence which such structural peculiarities were likely to exercise in the development of infantile diseases. A cursory comparison of the situation of the abdominal viscera, as they present themselves in infancy, with that in adults, will partly account for the diversities of symptoms which characterise the two periods. The stomach in infants, for instance, instead of occupying a transverse position, as is the case in adults, hangs almost perpendicularly, extending from the epigastric to the umbilical region. One result of this situation of the infantile stomach, is a corresponding change in the site of the omentum, which is always attached to its great curvature, and which, in infants, lies more towards the left than

the right side. Has it never happened, from this cause, that a disease has been referred to the colon as its seat, which dissection has shewn to be in the omentum? The liver too, which in the adult state recedes within the ribs, in infants extends to the central region of the abdomen. Here is another still more important distinction between the two periods. Perhaps there is no viscus that plays a more important part, in the production of morbid phenomena in infancy, than the liver, which, by its size, if only functionally disordered, seems to affect, at different times, every organ of the body. We cannot, in adults, discover the spleen, by the touch, except in a diseased state; yet in infants it is felt below the false ribs, and instead of being situate, as it afterwards is, in the left hypochondrium, it occupies, for the most part, the middle region. In children of three feet in height, the abdomen measures nearly one foot; and it is not found to exceed that in adults five feet high. Nor should we overlook the important distinction arising from the proportionately larger size of the brain, and the nerves which proceed from it, which is, probably, one cause why a greater disposition to convulsive diseases exists in infants, than in more advanced life. The greater degree of rapidity with which the blood is circulated in the first years of existence, is another important characteristic, which must not be lost sight of, in appreciating the pathology and treatment of infantile diseases. Now, without assigning an undue share of importance to these and many similar peculiarities of the infant structure, it cannot be doubted that they are calculated to produce cor-

responding modifications in the aspects of disease at this tender age, and that though there is a greater morbid sensibility in some infants than in others, yet, that in all, there is a singular susceptibility to intestinal irritation, especially during dentition, with which it is not always prudent to interfere.

The disposition to spasmodic diseases, (as I have shewn in a former paper) is great, during infancy, whether from peculiarity of structure, such as the size of the brain or liver, or from the situation of the abdominal viscera above alluded to, is a problem not easy of solution. In fact, the processes which are yearly taking place from infancy to puberty, are replete with wonders and inexplicable phenomena. One thing appears certain, that, as the abdominal viscera gradually assume the situation they are to occupy in after-life, the susceptibility to a certain class of diseases becomes less. At the age of puberty, the liver assumes a higher situation, so as to be almost entirely covered by the ribs, when the person is in an horizontal posture. Coincident with this change, is a corresponding alteration in the position of the stomach, which gradually deviates from a perpendicular to a horizontal line: other changes of a similar kind take place. Now, after all these changes are complete, do we find the same liability of the system to hydrocephalus, to croup, to pertussis, and to certain eruptive diseases, as existed anterior to this change in the size and relative position of the viscera? Do not these, and many other affections, disappear at the age of puberty? Certain changes take place in the system in both sexes, at that period, which, along with the altered position of the

viscera, tend to create corresponding variation in the functions of health, and in the phases of disease; and it is only by studying the physiological peculiarities of each successive period of life, that we can hope to arrive at a more correct appreciation of the endless modifications of disease, which are apt to present themselves in the progress from infancy to puberty. Nor should we despise such aids as are attainable, for the purpose of acquiring a better insight into the origin of certain classes of symptoms the effect of irritation, and its tendency to produce inflammation or organic change, not only in the part where the irritation begins, but in remoter organs. How many children have been treated for hydrocephalus, where all the symptoms indicative of that disease, arose from intestinal irritation—perhaps from worms! The sympathetic irritation of the brain may, perhaps, produce a turgescent state of the vessels, and, unless these are relieved by decisive treatment, actual effusion may follow. This may be the case, and yet the primary source of mischief may be in the abdomen. In one child, the irritation may have no other effect than the production of pain in the seat of irritation, without the system participating in any material degree; in another, it may cause fever, or, perhaps, some spasmodic symptoms; in a third, the skin will share in the affection. In some, the original is often masked by the secondary disease, and its existence unsuspected, until after death, dissection detects the initial seat of the disease. Convulsions, and other symptoms of cerebral irritation, may attend an inflamed liver, and prove fatal, and yet the primary source of the evil may escape detection

during life. How often have children complained of pain in the side, and, sometimes, of cough; so much so as to awaken the fears of their friends, lest the germs of consumption were about to unfold themselves; and the secret of the mischief is not developed, until the casual exhibition of some aperient brings to light the true cause of the symptoms, the presence of worms. The nervous communication between certain portions of the intestinal canal, and branches supplied by the intercostal nerve, may, in the opinion of some, explain this phenomenon; but this sort of sympathy appears to exist, where no such direct nervous communication is found, for there is hardly a viscus that has not been sympathetically affected by the irritation occasioned by these parasitic animals in the intestines. Even the functions of the heart will suffer from this cause; and, as will be seen in some of the cases detailed in this paper, choreal convulsions have gradually ceased, after the bowels have been freed from their verminous contents. The same may be said of periodical amaurosis in children, which often depends on a disordered state of the chylopoietic viscera; sometimes originating in gastric, at others, in hepatic, irritation; or, perhaps, in a merely overloaded state of the bowels. There is a case of functional amaurosis in a child, Anne Dickson, æt. 10, an out-patient of our infirmary, which is usually relieved by a succession of emetics and cathartics, and, if the costiveness, to which she is subject, be neglected, the vision becomes impaired, and continues so for some days. She has been formerly subject to epileptic fits, so as to excite a suspicion that the amaurosis may be connected with

some organic lesion of the brain. Whether this is the case or not, it is evident that the cause of impaired vision, if it has not its seat exclusively in the bowels, is under the influence of those remedies, which restore those organs to a healthy state. It has, however, been deemed right to resort to the repetition of blisters, for the purpose of relieving cerebral congestion, or, even, organic disease of the eyes themselves. It is unnecessary to detail further examples of the proteal forms of infantile disease, or to dwell on how much is attributable to sympathy with distant organs. Such examples are familiar to every practitioner; but, while I am calling attention to functional, I must not omit to remind my readers, that structural changes, of a fatal kind, develope themselves even in a few days after birth. It has often been said, that we have all the seeds of death at our birth, and the truth of this remark has been forcibly illustrated by the dissections of M. Cruveilhier, who has given us a fearful list of congenital malformations, from which it would appear, that there is hardly a viscus in the human body, which has not been found in a state of malformation, and that to this cause is owing, in many instances, the sudden death of infants. But these are evils inseparable from our nature, and against which no human art can provide. Other evils there are, which are remediable, and the decreasing mortality during infancy, is a sure proof that much may be done, and that the treatment of infants is better understood than it was formerly. That still further improvement will take place, the spirit of the age will not permit us to doubt. The morbid anatomy

of infancy has been too long neglected in this country; neither have we sufficiently cultivated a knowledge of those diagnostic signs, which would aid us in recognising the seat of infantile suffering, such as the action of disease on the facial muscles, on the position of the limbs during sleep, on the secretions, on the respiration, &c. The alteration of colour which the face presents, the expression of the physiognomy, and the prominence of certain muscles, have been regarded by many able physicians on the continent, as capable of affording important indications of the seat of disease in infants. These, and other sources of information, deserve, at least, more attention than they have hitherto met with. But, on these points, I confess my experience has not enabled me to come to a satisfactory conclusion; I shall, therefore, defer any further observations to a future opportunity, and shall resume the subject commenced in my last papers—the diseases of the larynx, trachea, and the bronchial tubes, incidental to the period of infancy.

The researches of late pathologists have shewn that, in some instances, at least, of fatal croup, the disease commences with the ordinary symptoms of cynanche, the inflammation spreading from the fauces to the air passages; and that the two diseases, if not identical, do not unfrequently co-exist, must be evident to every one who has witnessed disease of the tonsils, often of a malignant nature, followed by dyspnœa, stridulous cough, and sibilant inspiration. This conjunction of disease of the fauces with that of the larynx and trachea is not unnoticed by the earlier writers, but the physicians of former times

do not appear to have availed themselves of post-mortem investigations in this disease, though it was so fatal. This task has been reserved for modern investigation. Dr Bretonneau, an able French pathologist, has stated that out of more than sixty dissections he has only twice found the false membrane confined solely to the air passages, while in all the other instances, the disease invariably commenced in the pharynx, and presented, in the beginning, the symptoms of angina gangrenosa. I am induced to notice this opinion of the French physician the more readily, as it occurred to me, during the last summer, to witness several instances strongly corroborative of the above facts. In many parts of this district the scarlet fever then prevailed very extensively, and particularly amongst children, and the mortality was unusually great. In many instances malignant sore throat accompanied the eruption; and, as might be expected, it was amongst these that the mortality was the greatest. In one parish, Kirkheaton, no less than thirty died in a few weeks. It was my lot to witness the disease in its most malignant form. There was considerable variation in the symptoms, but I was struck by the frequent occurrence of stridulous respiration and difficulty of breathing, supervening on the soreness of the throat. In some instances the dyspnœa was synchronous with the sore throat, in others it occurred only after the tonsils were affected with redness and tumefaction, and sometimes not until the specks made their appearance in the fauces. Cough was no infrequent concomitant, sometimes dry, or accompanied with a frothy sputum. The sound of

the cough resembled, in many instances, that of croup. Yet, of these, some were saved, though, in general, the extension of the disease to the air passages terminated unfavourably. It seemed, in many of these cases, as if the inflammatory action had extended beyond the bifurcation of the trachea, to the bronchial tubes; and the quantity of matter found, on a post-mortem examination of one of these cases, almost blocking up the air passages, was sufficient to account for the fatal result. A portion of the membranous crust, also, not unlike what is found in ordinary croup, was detected in the lower portion of the trachea, and I was informed that, in the expectoration of many of these patients, considerable portions of membranous films had been ejected during a fit of coughing. In the cases which came under my treatment, there was the usual variety of symptoms; but when the throat was much affected, and especially where the fauces were covered with sloughs, I was induced to apply a weak solution of the argentum nitrat. to the parts, by means of a camel hair pencil, and by an occasional and cautious repetition of this plan, we were enabled to modify the specific inflammation of the parts, so as to arrest, in many instances, its further progress. Some of the cases, so treated, gradually recovered; but the application of this remedy should be conducted with great circumspection, as a too frequent use, or an excess of strength of the solution, might sometimes create more violent excitement than that which it was intended to relieve, though no such result occurred in any of the instances I have alluded to above. The same plan, I

am aware, has been adopted by others, with different results; but, of course, where the disease has extended to the larynx and trachea, the chance of success is less; but even where the inflammation has gone beyond the reach of the eye, in its progress downwards, this method of treatment, combined with the use of calomel and nauseating medicine, seems to me to hold out the most likely promise of success. I am not prepared, however, to coincide with Dr. Bretonneau, who contends that bleeding in croup is always hurtful; nay, he even extends his objection to local bleeding and blistering, and insists that topical treatment, with the exception of calomel internally, was the only thing that appeared to do any good. His principal reliance is on the application of the concentrated muriatic acid, by means of a piece of fine sponge; and where it is intended that the effect should extend beyond the part with which the sponge first comes in contact, the acid is diluted with various proportions of honey. No doubt there are cases in which this mode of treatment may be very successful; but when the disease has extended to the air-passages, it can be of little use, especially if false membrane already exists in the trachea. In such instances, the lunar caustic solution appears to me, more likely to extend its influence to the mucous membrane of the trachea, and, if carefully applied, with less danger to the patient than the muriatic acid. We know that the most beneficial effects have resulted from the use of the argentum nitratum, not only in affections of the cutaneous surface, but in irritable diseases of the eye, and in syphilitic sore throat. Mr. Higgin-

bottom tells us, that he is in the habit of applying the caustic over and beyond parts where an erysipelatous inflammation is spreading, and that he has had the satisfaction to find that the inflammation has thus been arrested in its progress, and has shortly subsided. In one of the children where I used the solution of lunar caustic to the fauces, the sore throat had existed three days, and, on inspection, the soft parts about the back of the mouth, were of a cineritious colour, while the deglutition was impaired. The voice, too, was hoarse, and the breathing embarrassed. Leeches had been applied to the neck, and an emetic solution given, repeatedly, by order of her surgeon, Mr. Lockwood; and she was taking, also, calomel three times a day. The topical application of the solution was repeated three or four times in two days, and more than once afterwards. The viscid concretion enveloping the fauces was gradually detached, and the subjacent surface became clean and healthy, the voice natural, and the respiration free. The same application was tried, by my direction, in some other similar cases, but, in those instances which terminated favourably, both the calomel and the tartar emetic solution were employed, and it is not always easy to say what share remedies of such power might have, in producing the auspicious crisis. One of the cases, however, in which the solution was employed with success, was that of a child, Mary Cummins, æt. $3\frac{1}{2}$, in whom the symptoms were more than ordinarily malignant. Two of the family had recently recovered from scarlatina, one of whom had a sore throat, combined with the efflorescence of the skin. In both of these cases,

little medicine was required in the removal of the symptoms. The child had complained of sore throat and hurried respiration, for some days previous to my visit, for which an emetic was given, with some saline medicine. On viewing the internal fauces, I found a number of sloughs of a shade between a light ash colour and a dark brown, and the tonsils ulcerated. There existed, also, severe dyspnœa and cough. The solution was applied to the parts, for two or three days, before the sloughs were entirely detached, and the child began to recover. The irritation, at any rate, if not the inflammation, of the air passages was thus arrested, and the cough subdued. Here, though no false membrane had already formed in the trachea, yet, judging by the symptoms and the result of other cases, we had every reason to apprehend the extension of the mischief to the organs of respiration : at the same time, I am bound to confess, that there were other cases of a similar kind, in which the same treatment was not rewarded by similar success.

But I have not unfrequently observed this sudden supervention of cynanche trachealis on sore throat in children, where the scarlatina was not epidemic ; resembling that modification of the disease described by Dr. Hamilton ; and there were several fatal instances of this kind in children, amongst the poor, who were out patients of the infirmary, during the last winter.

The disease was insidious in its approaches. At first, the uneasiness in the throat is inconsiderable : after a few days, several grey patches are seen on the tonsils, sometimes stationary, at others enlarg-

ing, and encircled by a red and humid margin. The pulse is not always quick, and the deglutition not much impeded. Neither are the other symptoms such as excite alarm. But after the lapse of a few days, the respiration becomes affected; sometimes difficult; at others, only slow, without irritation or pain; but often assuming the form of croup, in its initial symptoms; and, in some instances, speedily putting on the worst features of that fatal disorder. Neither is this form of disease so much a matter of surprise, because, in cases of ordinary croup, we find, as the disease advances, the tonsils, uvula, and velum pendulum palati, more or less implicated in the inflammatory process. But whatever was the degree of violence of the tracheal affection, it was usually a consecutive, and not a primary affection; and whether its appearance was early or late after the first affection of the tonsils, it was generally the harbinger of death: and it seemed as little obedient to the action of remedies, as the more malignant form of croup. Neither leeches, nor blisters, nor emetics, nor calomel, appeared to retard its fatal progress; and, in fact, the death of the children was generally attributed to croup; the same suddenness, and the same degree of violence accompanying both. Whether a judicious application of the lunar caustic solution to the fauces, in the early stages of the complaint, might not have prevented the supervention of the croupy combination, by introducing a new action in the part, future experience may determine. But if, indeed, as has been asserted, croup, in its most ordinary form, first attacks the surface of the tonsils, then it must evidently be a matter of the

last importance to detect the first developments of a disease so destructive of infantile life; and which, if remediable at all, is, at any rate, most susceptible of relief before the inflammation has extended itself to the mucous membrane of the larynx and trachea, and before the coriaceous exudation has become too great to be dislodged by the action of medicine.

There is no part of infantile pathology involved in greater mystery than that of the respiratory organs, and especially as respects the larynx and trachea. To how many functional, as well as structural, affections are they liable! Indeed, the state of the respiration, even in health, the number of inhalations, and the greater rapidity of the circulation peculiar to infancy and childhood, form, of themselves, important distinctions, and should never be lost sight of in appreciating the degree of disease at that tender age. Not only the brain, but the nerves which proceed from it, are larger, at this period, in proportion to the rest of the body; and this, alone, might account for the greater degree of susceptibility to nervous impression, and the greater frequency of convulsive affections. It seems that the organs concerned in respiration are peculiarly sensitive in infancy; in some there is a predisposition to spasmodic, in others to inflammatory, action. Nay, such is the violence of the spasms in the spasmodic croup, that death is sometimes extremely sudden, and yet no organic change may have taken place in the larynx, or the parts immediately adjacent. In some infants I have known this to occur, where the gums had been repeatedly lanced, and proper attention paid to the bowels. Effusion may

have taken place in the ventricles, in these fatal instances, but if so, it must be regarded as a consequence, rather than a cause, of the spasmodic affection, just as occurs in some fatal cases of hooping cough ; for, if it were the cause of the spasm of the glottis, this affection should be oftener fatal than it is ; and yet we see and read of a variety of such cases that terminate favourably, sometimes by tonic treatment, at others by a mere change of air, or change of nurse. Some infants, indeed, are in the frequent habit of making a crowing noise in breathing, when otherwise in apparent health. Such a habit, however, is indicative of a tendency to spasmodic constriction of the glottis. It may be momentary, and the spasm may never be succeeded by unpleasant consequences ; yet, as such attacks often increase in violence, if the exciting cause remains, it is of the last importance to remove the source of irritation, whether it is connected with dentition or the state of the bowels ; and if it cannot be relieved by proper attention in these respects, it will often be necessary to resort to a change of air, or change of nurse, and sometimes to both. It is of importance, too, to examine into the state of the fauces, (a thing sometimes difficult,) as it will be found that, in different infants, there is a considerable difference in the size of the tonsils, they being, in some, much larger than in others. Now, in one or two instances of late, where I had noticed this crowing noise in respiration, on inspecting the internal fauces, it appeared to me that the tonsils were too large,—larger, at least, than I have seen them in other infants of the same age. If such a state of hypertrophy exists in

the tonsils, whether congenital or otherwise, may it not be itself a source of irritation, and, sometimes, superinduce paroxysms of dyspnœa, simulative of spasm of the glottis?

May it not, also, in some instances, predispose the child to attacks of croup? To ascertain what degree of reliance is to be placed on this supposition, it will be necessary to attend a little more to the appearance of the tonsils in a healthy state, and where the croup is epidemic, to examine the fauces, and mark any incipient change. It is a common complaint, that the diseases of children are more difficult to detect than those of adults, from their inability to explain their symptoms. If this is correct, does it not impose upon us the indispensable duty of studying the appearance of children in health, and of watching the first dawnings of disease. If it is true that a tumefied state of one or both of the tonsils is a frequent precursor of cynanche trachealis, is it not of some importance to arrive, as early as possible, at the knowledge that such enlargement exists, in order that we may have it in our power to take such steps as may best counteract the approach of the latter disease? At present there is every reason to believe that the first stage of the disease (that is, the mere affection of the tonsils,) is not unfrequently over, before the least suspicion is entertained of the impending evil. I am not sanguine enough to suppose that, if it were possible to detect the first indications of croup, we could often arrest its progress; but it is quite certain that, if allowed to extend itself to the air passages, however judicious the treatment may be afterwards, the period is often

past when a successful impression can be made on the disease. What do we find in dissections of such patients, after death? A membranous exudation often extending through the trachea, and penerating the bronchia below its ramifications; or, perhaps, as observed by Dr. Jackson, of Pensylvania; "in the inferior lobe of each lung, there is a high sanguineous congestion, such as exists in the acute stage of peripneumonia, resembling hepatization; while *an entire lining of coagulating lymph* extends from the superior margin of the glottis, through the larynx, trachea, and bronchial tubes." Such are the morbid appearances detected in the post-mortem inspection of a case of croup, as published in an American Journal of Medicine. My reason for selecting this case, is to shew that the most energetic treatment will *often* be as fruitless as the most inert, when once the stridulous sound peculiar to croup is heard. The case here recorded is that of a female child, æt. 4, in whom *the inflammation of the tonsils had existed several days* before the respiration became stridulous. At this period, *venesectio ad deliquium* was employed with the warm bath, with partial relief; afterwards, sixty leeches were applied to the throat, and, subsequently, a blister, still using the warm bath, with three grains of calomel, every half hour. Seven days after the first attack, the muriatic acid was applied to the fauces, by means of a brush. Other remedies followed, yet the child expired on the ninth day after the first affection of the tonsils, and four days after the larynx and trachea indicated participation in the disease. It will not be denied that, in the treatment of this case, there was no lack

of energy, yet the use of the muriatic acid was not thought of, until unequivocal evidence was afforded of the extension of the disease to the trachea and larynx. The action of the argentum nitratum, or the muriatic acid, may be very local, and very limited; yet it is unfair to draw conclusions from the present case, in which the period for using the acid appears to have been deferred, until all treatment was hopeless.

I do not wish to assign higher remedial powers to the solution of nitrate of silver, than it deserves, yet having frequently applied it, with the greatest benefit, to the fauces of adults, and, occasionally, to those of children, where the tonsils were affected, and where there was obstruction in the breathing, I cannot agree with those who consider it a useless practice, or one calculated to make only a local or limited impression. But future experience must decide the point.

Nor is it to the tonsils alone that I would direct attention; there is reason to believe that the uvula may, from various causes, be in a state of hypertrophy and relaxation, so great, as to keep up a constant irritation, and, in the opinion of Baron Larrey, even to occasion actual suffocation. I have seen, in many instances of laryngeal affections in adults, the most decided relief follow the removal of a portion of the uvula, which, by its elongation, was a source of continued irritation. In one such patient, I had the pleasure to find an almost immediate amendment in the cough, as well as other symptoms; and, no doubt, cases occur, where this state of the uvula has often been overlooked, and the cough and other symptoms have been attributed to a chronic dis-

ease of the larynx. It will sometimes happen that, in epidemic fever, accompanied with sore throat, the uvula is the first part affected, projecting into the rima glottidis, and threatening instant suffocation. In such cases the breathing is embarrassed, the voice extinguished, and the deglutition impeded. Yet, have not such symptoms occasionally occurred, without the real source of the mischief being even suspected? A case of this kind is recorded by Baron Larrey, where excision of the uvula gave instant relief. The patient was threatened with immediate suffocation, and, on inspection of the throat, the uvula was found drawn down into the rima glottidis, to the extent of nearly half an inch, by the act of inspiration. By its removal, perfect freedom was given to the respiration, and the patient was extricated from impending asphyxia.

Sometimes the uvula is in a chronic state of elongation; it may be very slight, yet sufficient to keep up a constant tickling cough. Its proximity to the larynx may even lead to organic changes of that part, in children as well as adults. Nor am I sure that some temporary elongation does not occur in some persons, from certain functional derangements of the digestive organs; at least, after the action of an emetic, the uvula will often appear to rise in its position, higher above the root of the tongue. This circumstance, as well as freer expectoration, which often follows emetics, may have its share in the relief, in those cases where the cough and dyspnœa have been troublesome. The same relief will, sometimes, follow the use of an astringent, or stimulating gargle, to the relaxed uvula, though

it will often require a long and steady perseverance to answer this end. I have used, with this view, in some cases of this kind, a solution of the nitrate of silver, varied, in point of strength, and applied by means of a camel-hair pencil; and, unless the case is very urgent, or the uvula too elongated, this plan may supersede the necessity of excision.

This method I am at present adopting in the case of a young lady, in whom such a state of the uvula exists, and who has, for some time past, been harrassed by a troublesome cough, which has been regarded as indicative of impending phthisis, and for which she has taken a variety of pectoral medicines. The repetition of the emetic, and the use of the solution, applied in the way I have before mentioned, have relieved the irritation, and, in fact, produced considerable alleviation in her cough, as well as other symptoms; and, if I do not greatly err, a perseverance in the same plan will gradually remove her complaint entirely; for, with the exception of slight pains in her side, there is nothing to indicate the existence of tubercles, either by the sound of the thorax, by the aid of the stethoscope, or from the state of the symptoms generally.

But of all the diseases which invade the organs of respiration, anterior to the age of puberty, there is none more frequent or more intractable than the hooping-cough, in young and delicate children; the symptoms of which, though so familiar to every practitioner, yet too frequently bid defiance to the utmost efforts of our art. By some it has been regarded simply as a spasmodic affection; by others, in its

initial state, as decidedly inflammatory; but, whatever is the true solution of this difficulty, one thing seems established by indisputable testimony, viz. that, in fatal cases, dissection has developed marks of inflammation, often to so great an extent, as, by its swelling, to close, mechanically, the glottis; while, according to Mr. Alcock, the mucous membrane of the trachea and bronchia is increased in vascularity, and the fluid, in their cavities, varies from a thin mucus to a perfectly-formed pus. Now, with such evidence before us, we can entertain no doubt, whatever may be the primary cause of the disease, that, in the sequel, it is apt to superinduce inflammation of the mucous membrane lining the air passages; as little doubt can there be, that the accumulation of matter there, acts as a source of irritation, and that the paroxysms of cough are more or less violent, in proportion to the quantity collected. The action of an emetic will often give speedy relief, by dislodging the mucus accumulated near the top of the larynx; but it does not necessarily prevent a fresh accumulation. Cases of hooping-cough have terminated fatally where emetics have been repeatedly administered; sometimes from congestion of blood in the head; at others, from congestion or inflammation in the organs of respiration. It seems, however, that, in some children, there is a greater disposition to local congestion and inflammation, than in others. Where this is suspected, no prudent practitioner will hesitate in applying leeches, or, even, in some instances, using the lancet in the early stages of the complaint; a practice, I am convinced, which would frequently prevent the

supervention of many of those consequences which are often more fatal than the disease itself. But, even where such treatment is adopted, the specific disease still remains; there is still a recurrence of paroxysms, in spite of the power of medicine, sometimes, perhaps, of less violence and not so frequent, but still a tendency to run a certain career. Neither has it been our good fortune to discover any remedy, which can do more than mitigate the disease, for though the tincture of cantharides and the prussic acid, and various other medicines, do, now and then, seem to exercise a remarkable influence over the frequency, as well as the violence, of the fits, yet, perhaps, in the very next case they have no power at all. The same may be said of the internal use of tartar emetic, as well as of its application in the form of plaster. In some the tincture of lobelia will relieve the violence of the spasms, and I have exhibited it, in conjunction with the tinct. lyttæ, with decided benefit; but it is the case with these, as with a hundred other supposed remedies, that, combine them as you will, they may be partially useful in isolated instances, yet there is not one of them that deserves the name of a specific. I believe that the liquor arsenicalis has been used with singular effect in some solitary cases. A medical friend of mine acquaints me that he has, in more than one instance, succeeded in arresting the frequency of the fits in a few days, by small doses of Fowler's solution, given in decoct. cinch.; but most practitioners would prefer a medicine which is not so likely to excite anxiety in the mind of the prescriber during its exhibition. During the twenty years it has been

my lot to visit, at their own homes, the out-patients of the dispensary in this place, I have had abundance of opportunities of treating this disease, it having repeatedly prevailed as an epidemic among the children of the poor; yet, though every probable plan of successful treatment has been resorted to, the utmost we could boast of, was, that, in its acute stage, we had, sometimes, the good fortune to save a patient by vigorous treatment; and that, in its more advanced stage, we often succeeded in mitigating its violence, and abridging the term of its duration. In the years 1814, 1816, 1825, 1828, this disease prevailed in many parts of the district, and, in one year, many children fell victims to its severity; among these, several had suffered severely from cough, during the measles, a few months before.

In the same year, and after the same disease, the croup, also, not unfrequently made its appearance; and, indeed, so nearly similar was the violence of the symptoms of the hooping-cough, that, in many instances, the same energetic treatment was as necessary as in croup. In the milder cases, however, it was not always requisite to resort to topical bleeding or blistering, but the final removal of the disease appeared, in some instances, to be accelerated by spinal irritants, and, in others, more by a change of air than by the power of medicine. It did not appear that those children who laboured under porriginous affections of the scalp escaped the hooping-cough, but, in general, the bronchial affection was less severe, and the cerebral irritation not so great, as in children without any cutaneous affection; and this, indeed, is consonant with experience, for it is

well known that the premature suppression of a cutaneous discharge in children, is often pregnant with danger; tending to superinduce a state of the brain not unlike what is sometimes seen in fatal cases of hooping-cough: and I am of opinion that, with regard to those forms of porrigo which usually disappear, spontaneously, at the age of puberty, there is some mysterious connection with the general state of the system, and some salutary purpose to be answered by these eruptions, which it would be sounder policy to imitate, than officiously to counteract. If not calculated to subserve some wise purpose in the animal economy at that tender age, why are they not common to every period of life? At this time, when, from the disproportionate size of the brain, and of the nerves in general, there is an extraordinary tendency to convulsive disorders, may not these cutaneous manifestations preserve the balance of the constitution, or furnish salutary outlets to some morbific humour? This, at least, appears to have been the opinion of some of the older physicians; and experience has convinced me of its practical value. The desire to remove a loathsome eruption, will often induce ignorant parents to have recourse to repellant applications, without the knowledge of their medical advisers. This is no uncommon case; and it has happened to me to witness some of its pernicious consequences, within the last few weeks. Two cases of hydrocephalus, which terminated fatally after some days illness, occurred in the same neighbourhood, in both of which the tinea capitis had been cured, too precipitately, by repellant applications. One of the children had been

attacked with epileptic fits for some time before the comatose symptoms appeared; and the other had severe pains in the head. They were both seen by Mr. Ledyard, the house-surgeon to the infirmary, who employed the most active means to counteract the progress of the disease, and to restore the eruption on the head. I learned from the mother of one of these children, that she had purchased an ointment, for her child's head, from an itinerant quack. I have met with other cases, where I had reason to believe that other viscera, as well as the brain, suffered from a premature removal of the tinea. Even the organs of respiration are affected by it: the bowels, the stomach, and the mesenteric glands, will often undergo functional, or even structural derangement from this cause; such is the intimate sympathy existing between the skin and interior organs.

I have already stated that the repulsion of a chronic eruption of the skin has been occasionally followed by epilepsy, particularly in persons in early life. I have reason, also, to believe that choreal convulsions sometimes have their origin from the same source: one such instance occurred in one of the out-patients of the infirmary, during last winter; Sarah Dyson, æt 10, who had been affected with the disease for some months before I saw her. She had been subject to cutaneous eruptions from her infancy, and had been cured, as she said, of the itch, about a year ago: since then she has had occasional head-ache and diarrhœa; and was admitted as an out-patient of the infirmary, in the early part of the winter, with all the usual symptoms of chorea. The purgative plan was persevered in for some weeks,

and leeches applied to the head: afterwards the tartar-emetic ointment was used to the spine, and the pustulation, which was very copious, maintained for several weeks. By a perseverance in this plan, and the use of the persesquinitrate of iron,* greater stability was gradually given to the muscular power; and the jactitation and embarrassment of speech were ultimately removed. About the same time, another choreal patient was admitted: John Jagger, who began, in his eleventh year, to be troubled with pain in his head and back, which was followed by the convulsive movements, and other symptoms, characteristic of chorea, only that they were stronger on the right side than the left. He had been relieved by counter irritation on the spine, and the use of purgatives, followed by the carbonate of iron, for some months; but now applied for relief, in consequence of a relapse. His symptoms were, however, the same as before, with the addition of considerable pain and fullness in the direction of the transverse arch of the colon; and there was, also, some uneasiness, on pressure, over the valve of the colon. He was, in consequence, put on a course of aperient medicine, and though this plan was persevered in for some weeks, yet the pain, on pressure, in the right iliac fossa was not removed, which induced me to apply leeches to the part, and, afterwards, both a blister and tartar-emetic ointment. I thought it right, also, with a view to arrest any structural disease near the valve of the colon, to exhibit

* The formula of this medicine is to be found in a communication of a Glasgow surgeon, in a late number of the Edinburgh Medical Journal.

mercurials until the gums were slightly affected. The case was very tedious, and it was only after several months that his choreal malady was overcome; for, after the bowels had been brought to a more healthy state, the irregular action of the muscles did not immediately give way. As his strength returned, this morbid action of the nervous system gradually disappeared. This, as well as the preceding case, serves to shew how various are the sources of irritation, which evoke this anomalous action of the nervous system. In another case of chorea, which came under my care, in a little girl, æt. 9, residing at the Paccock, the disease had continued for more than two months, before her admission as an out-patient to the infirmary. She was ultimately, though slowly, cured, after a course of purgatives, which brought away worms for many weeks. A liniment to the spine, and chalybeate drops, were all the remedies, except purgatives, that she used.

No pathological fact seems better established, than the sympathy between the brain and the abdominal viscera; in so much, that cerebral irritation may have its origin alone in some viscus within the abdomen. There is, even, reason to believe, that this initial state of irritation may assume the characters of inflammation, in some cases, and, even, in others, lead on to effusion. So complicated do the symptoms not unfrequently become, that a practitioner may have no clue to determine which organ is first affected, or whether the morbid action stands in relation of cause or effect. I am now in attendance on a patient of Mr. Bradshaw's, surgeon, of this place, Anne Ellis, æt, 9, who was subject to pains in her bowels before

her present attack, which took place on the 2nd of September. At that time there was no uneasiness in the bowels, but the head was the seat of violent pain, with great suffusion of the eyes, and intolerance of light and sound. The pulse quick and strong; the thirst great. The stools were dark and fœtid, and there was evident fullness of the belly. She was bled and leeched, and, with each dose of a saline mixture, a calomel powder was prescribed. On the 3rd, the infusion of senna was given, which brought away *some worms along with the stools.* On the 4th, the pain of the head was less, but there was coma, *with inability to move the right hand;* and, in the evening, some delirium. The leeches were repeated, and a blister applied to the nape of the neck. On the 5th, the insensibility remaining, in addition to her other treatment, the ung. hydrarg. was ordered to be rubbed into the thighs at bed time. On the 6th, the day I first saw her, the coma was somewhat relieved, but the excrements were still dark coloured and fœtid. The head had been washed with cold lotions, and the blister kept open. The calomel powders were continued, and a turpentine enema ordered. On the 7th, large evacuations had been produced by the glister, including large masses of scybalæ, with several worms. There is still, however, pain, on pressure, around the umbilical region. To continue the calomel powders, and foment the abdomen with chamomile fomentations. 8th. Pain of the abdomen less, and the head relieved. *She can move her right hand freely.* From this time there was a gradual declension of the symptoms, and though still obliged to pay strict attention to her

bowels, she is quite free from all cerebral affection, and will, probably, in time, be restored to health.

In a former paper on the diseases of children, I have alluded to a variety of chronic affections, which were relieved by the use of iodine. Though it may seem superfluous to attempt to prove, what all are ready to concede, yet, as most of the instances of its virtue, that are recorded in our periodicals, refer to adults and not to children, it may not be amiss to enumerate one or two cases where this medicine has been signally useful in the removal of morbid affections in early life. And first, I will state an instance of its external employment in the case of Ellen Ramsden, æt. 11, an out-patient of our dispensary, who was admitted for a chronic disease of the liver, the size of which was so large, as to impede her respiration, and occasion great irregularity in her bowels. The functions of the heart were also embarrassed, for the palpitation was often excessive. It appeared, too, that the spinal column itself had sustained some lateral deflection from this cause, for it had never been so observed before the liver became enlarged, nearly two years before. She had already been subjected to active treatment,—leeches, blisters, mercurials so as to affect the mouth, &c.; but still there was no material diminution of the enlargement. The nitro-muriatic lotion was employed for some weeks without any apparent benefit. Under these circumstances, the external use of the ointment of hydriodate of potass was advised, using, at the same time, the calomel pills internally. We were, occasionally, obliged to intermit the ointment and the pills, but, in five or six weeks, a very considerable

reduction of the abdominal fullness occurred, and, in three months from the first adoption of this plan of treatment, the remaining enlargement was so inconsiderable, as in nowise to impede the respiration, or disturb the functions of the heart. Her bowels became regular, and her appetite returned. Her mother informed me, but a few days ago, that she was so far restored to health as to go into service.

The next case is intended to shew the efficacy of the same medicine administered internally. Wm. Stanley, æt. 3, was attended by my friend, Mr. Tatham, surgeon, of this town, from whom I have received the particulars.

June 16th.—W. S. has been out of health from the period of his infancy, and has had, for some time, great tumefaction of the abdomen. Facies leucophlegmatica. His emaciation is great, and he is unable to walk. The tongue furred; breath fœtid; bowels variable; great inclination to sleep; respiration oppressed, and there is general languor and muscular debility. ℞ Ol. ricin. f. ʒiij. ft. haustus statim sumendus.

17th.—Has had several dark and slimy stools, from the oil. ℞ Potassæ hydriodat. gr. xxiv.; aquæ destillat, f ʒi. M. f. guttæ de quibus sumantur guttæ, x.; ter quotidie, et paulatim augeatur dosis ad guttas xx.

30th.—Is much improved; the abdomen less tumid; the appetite more regular; but the evacuations still of an unnatural appearance. His bowels are kept regular by castor oil and occasional doses of calomel and jalap.

July 15th.—Is still improving, and takes twenty drops of the solution three times a day.

August 23rd.—Considerably better. The drops to be discontinued.

30th.—The abdomen is reduced nearly to its natural size. The general health is tolerably good, and he can now run about.

This child had, afterwards, a relapse, but eventually recovered by employing the same means, proper attention being paid to his bowels, and to his diet.

The second case which I shall here insert, of a child to whom the hydriodate of potass was given, was also attended by Mr. Tatham.

May 27th.—Dorothy Taylor, æt. $2\frac{1}{2}$. The abdomen, in this child, was large, with deep-seated pain, and frequent diarrhœa. The stools were of a light colour; the countenance pale; emaciation considerable; tongue tolerably clean; appetite keen; respiration quick and uneasy; pulse 140. She was ordered the chalk mixture, and, occasionally, a calomel and rhubarb powder for the first fortnight; after which she was much better of the diarrhœa.

June 11th.—Bowels relieved. She continues to loose flesh. Pulse 84. ℞ Potassæ hydriodat. gr. xii.; aquæ f ℥ss. M. f. guttæ. Cap. gtt. xv. ter dié ex aquâ.

14th.—Slight increase of fever and return of looseness. Contin. guttæ et mistura cretæ.

21st.—She appeared to be improving for a few days, and more cheerful, and took her food more freely. The bowels only moved twice a day, and the stools of a better colour. Continues to shrink in flesh; skin dry and cool; slight cough. ℞ Pulv. cretæ c opio gr. x. sumend. nocte maneque.

July 4th.—Appetite more regular ; tongue clean ; pulse 90. Bowels moved three times a day. Belly still large. Cont. pulv. et guttæ.

10th.—Improving. The powders having been omitted, the diarrhœa returned a little last night. Belly not so large. Repet. pulv. et guttæ.

14th.—Bowels regular ; gains flesh. Repet. med.

19th.—Continues to improve ; gains flesh rapidly. Has taken no powders for several days.

August 13th.—Bowels regular ; abdomen nearly natural. After this time all the symptoms were gradually relieved, and she was restored to a good state of health.

There are other cases of a similar description, where the tincture of iodine was given with the same success, but they are so similar, that I deem it unnecessary to detail them here. In infants, I have usually ordered the syrup of iodine in a little of the aqua cinnamom., but of course great judgment is necessary, not only in the choice of proper cases, but proper periods, for its exhibition. Some children, too, will bear a much larger dose than others.

SOME OBSERVATIONS

ON THE

INFLUENCE OF SLEEP

ON THE

VITAL FUNCTIONS.

BY ROGER WAKEFIELD SCOTT, M. D.

Physician to the Liverpool South Dispensary.

PART II.

CONTINUED FROM PAGE 269, OF THE 1st VOL. OF THE TRANSACTIONS.

On the state of the Vital Functions during Sleep.

ON a subject apparently so susceptible of direct proof, it is strange that so many conflicting opinions should have been entertained. The chief source of fallacy seems to have consisted in the want of due attention on the part of observers and experimentalists, to the different circumstances which modify the condition of the system during sleep.

The existence of latent organic disease, any functional derangement of the nervous system, especially if arising from the state of the digestive organs, the temperature of the apartment, the quantity and material of the superincumbent bed-clothes, the nature and quantity of the ingesta, the prevalence of particular corporeal actions, and innumerable other circumstances, have considerable influence on

the state of these functions ; and it is probable that, if a person in the most perfect health were the subject of experiment, they would be found liable to great variations, and scarcely twice in precisely the same relation to each other.*

To enter into an investigation of these minute differences, even if I were competent to do so, would exceed the limits allowed to this essay. I will, therefore, content myself at present, with a brief statement of the changes which are usually produced in these functions by sleep, in the ordinary state ; on a future occasion, I may, perhaps, venture to offer a few remarks on the modification of these changes in disease.

The Influence of Sleep on the Circulation.

It has been a laborious as well as difficult matter, to collect, and, even, to understand, the opinions of the older physiologists on this subject, as they are so frequently at variance with themselves, as well as totally opposed to each other. This discrepancy, which has existed from the most remote, till modern times, has arisen from an imperfect acquaintance with the circulating system, as well as from the different ideas entertained of the nature of sleep itself.

I may, however, divide them into three classes.

Hippocrates, Avicenna, Mayow, Senac, Morgagni, Hartley, and others, contend that the natural functions are performed with more vigour and activity,

* Bichat sur la vie et la Mort.

and that the action of the heart is more frequent and strong. Others, of no less authority, as Aristotle, Galen,* Hoffman, Haller, Langrish, Barthez, &c. state that the action of the heart is enfeebled, and the pulse, consequently, slower and weaker.

Boerhaave† and others maintain that, though the activity of the circulation is diminished, its energy is increased.

This latter opinion has been adopted by most modern physiologists. M. Double observes, that the pulse, at the commencement of sleep, is small and concentrated, but becomes gradually more developed as sleep becomes more profound, and is much the strongest when the individual is nearest to the point of awaking.‡

Hamberger counted the pulse of a child of 8 years of age, which was 100 during vigilance, and 11 beats less during sleep. The pulse of another, when asleep, was 80, and 86 when awake.

My own observations lead me to concur in the opinion of M. Double, and I have no doubt that, in a state of health, though little difference can sometimes be observed, the pulse is naturally softer, fuller, and slower at the period he mentions; and where it has been found otherwise, it must have arisen from some internal irritation which has been overlooked.

In one case of paralysis which I had an oppor-

* "Pulsus in somno, parvi, rari, languidi.—Galen de Pulsu.

† Motus arteriarum, venarumque et cordis, (in Somno) fit fortior, lentior, æquabilior, plenior idque per gradus diversos augendo prout augetur Somnus.—Vide Prelect. Academ. ed. Alb. Haller, Taurini, 1745, vol. 3, p. 277.

‡ Considerations Semëiotiques sur les Songes apd. Journ. Gen. de Medecine, vol. 27, p. 129.

tunity of seeing, where there was great lethargy, the pulse of the individual, which was frequently examined, was constantly diminished 5 or 6 beats at the moment of relapsing into that state, and as constantly accelerated when he was aroused.—(See note, page 431.)

To understand, however, more fully, what is the influence of sleep on the circulation, we must consider by what laws the latter is regulated.

As the motive powers of the circulation do not derive their energy directly from the brain or spinal nerves, but from the ganglionic system, their action is rendered more permanent, and less liable to those variations, and that exhaustion which occur in that system of nerves, which is more immediately under the control of volition ; and it is by this very independence that our organic life is preserved, and the energy essential to the functions of our animal life regenerated.

Though these powers are so far independent of the rest of the nervous system, that they are capable even of sustaining life after the animal functions have ceased, yet it is essential to the due harmony of the operations of the living body, that these two systems should possess a sympathy and relationship, and be capable, within certain limits, of influencing each other.

This influence is manifested in various ways, but it will be sufficient to mention the familiar instance of the effect of mental emotions, on the general, but more especially on the capillary circulation.

During vigilance, the unceasing activity of the external senses and internal perceptions, the motions

and position of the body, the impression of the external air, and temperature, and a variety of other circumstances, tend to increase the activity of the circulating system.

In sleep, however, from the diminution or quiescence of these functions of the animal life, and the absence of other stimuli, the organic functions are comparatively uninfluenced, and are performed in a more deliberate and equable manner. It follows, therefore, that the pulse, under ordinary circumstances, *must* be less frequent during sleep.

In sleep, also, respirarion being more slow and profound, the heart is not called upon to transmit the blood so rapidly to the lungs for the purpose of the chemical changes. It may, however, be argued, that the slowness of the respiration is the effect of the diminished activity of the circulation ; but, as respiration is not altogether an automatic, but partly a voluntary action, it is probable that they mutually re-act upon each other.

As the quiescence of the animal functions is seldom complete, and as some or other are in a greater or less degree of activity during sleep, so the pulse does not retain one unvarying standard, but is frequently temporarily accelerated by some internal irritation, or it may be by the stimulus of idea ; and it is very common for people of great nervous irritability to awake suddenly from some distressing dream, with a throbbing noise in their ears, and the pulse very much quickened, and not unfrequently with a violent palpitation of the heart.

The horizontal position, also, which is so essential in cases of syncope, has considerable influence on

the circulation, the heart being enabled to propel the blood with a less exertion of muscular force, its action becomes consequently slower, and, also, fuller, as a larger quantity will be allowed to accumulate in the ventricle before it contracts.

This is most apparent in very tall persons, whose pulse is sometimes 10 or 12 beats quicker in the upright than in the horizontal position, by the continuation of sleep, and gradual re-accumulation of nervous energy and irritability in the organs of the animal functions; one internal sensation after another arises, which sensations act as stimulants to the circulating system, and also produce a multitude of associated impressions on the sensorium, till the general excitement becomes too great to be any longer compatible with unconsciousness.

This, together with the increase of temperature, and a renovated energy in the ganglionic system itself, renders the circulation more quick and vigorous at the period of awaking, than at the commencement of sleep.

From the diminished activity of the circulation, and the general relaxation which takes place in the arterial system, especially the capillary, congestion takes place in the extremities of the veins and smaller arteries during sleep, hence the body appears of a larger size, and softer, and ligatures on any part become more tight, and the colour of the cheeks is deeper; all of which are marks of congestion in the superficial vessels.

The faces of some persons, however, become pale, and the features shrink, which is probably owing to the circulation, naturally languid, having its energy

so much impaired by sleep, as to be unable to propel the blood in sufficient quantity to the superficial vessels, and thus producing congestion in the internal parts. In these cases profuse enuresis and perspirations sometimes occur, especially in those who have been deprived of the stimulus of solid food and spirituous liquids, by which the equilibrium of the circulation has been accustomed to be preserved. It must be obvious how important an agent sleep is, and how necessary a right understanding of its influence is, in our treatment of disease. If the foregoing view of it be correct, it is manifest what advantage may be taken of it, as a remedial resource, both in nervous and vascular disturbance. I must reserve, for another occasion, a few remarks which I have thrown together respecting its *beneficial* or *injurious* effect in various diseases.

The Influence of Sleep on Respiration.

There are few provisions in the animal economy more beautiful than that of respiration; I do not mean so much with regard to the general purposes which it serves, but the manner in which it is performed. It appears to me one of the most remarkable instances of the intimate relation, and the independence and influence mutually exerted, between the ganglionic and sentient nervous systems.

Had respiration been altogether a voluntary action, it would have rendered life a *constant vigilance*, and have unfitted us for every purpose of rational existence.

Had it, on the other hand, been purely automatic, we should have been unable to have modified its power and activity, so as to accomplish the varied actions of which it is the instrument.

It is not essential to my purpose to investigate whether the first inspiration of the living animal be the effect of the stimulus of external air, as supposed by Elliotson,*—of the mere accidental action of the muscles, especially of the diaghragm, from the uneasy sensations arising from diminished temperature, and the contact of surrounding bodies, as was the opinion of Boerhaave,† Blumenbach,‡ and others,—of that appetite for breathing, as it were, "that peculiar sensation which determines the mind or sentient principle to put certain muscles and organs into motion," as argued by Whytt,§—of the rushing of the air into the vacuum formed by the action of the muscles in the attempt to swallow, as Haller‖ conceived,—or, as Dr. Wilson Philip attempts to solve the difficulty, by regarding the muscles of inspiration as entirely under the control of the will, which excites the action of those muscles to remove the uneasy sensation caused by the want of the necessary changes of the blood,—or, according to the supposition of Dr. Bostock,¶ of the vacuum formed by the removal of the pressure from the thorax and abdomen, and the subsidence of the different viscera to their natural position.**

* Notes to Blumenback, p. 84. † Institut. 691. ‡ Physiol. 151.
§ On Vital Motions, sect. 9, p. 111. ‖ Elem. Physiol. at 8, 5, 2.
¶ Quarterly Journal, vol. xiv. p. 100.
** Elem. Syst. of Physiol. vol. ii. chap. 7, p. 39.

Nor need I stop to consider how far in after-life it becomes an act of habit and associated feeling.

It is obvious that the primary cause is the presence of unchanged blood in the vessels of the lungs, which calls into action the diaphragm and other muscles; by what medium this impression is conveyed, is not yet clearly ascertained, whether the sensorium is always concerned in ordinary respiration, though it may become, by long habit, indifferent to, or scarcely cognisant of the sensation; or whether the impression on the ganglionic system alone, *without sensation,* is sufficient. In restrained or impeded respiration, we are sufficiently conscious of the uneasiness produced, but in ordinary respiration scarcely so; it is probable, therefore, that, in the latter case, the ganglionic system is sufficient, but in the former, that the sensitive powers are called upon to assist. The eighth pair of nerves is, probably, the medium of connection between the two systems.

In sleep, however, respiration is performed altogether unconsciously; for, even if sensation were required, it may be sufficiently excited to call into action the necessary muscles, without producing consciousness, as is the case with other muscles.

From the diminished activity of the circulation, the decreased expenditure of arterial blood, and, consequently, the less necessity for the chemical changes, respiration becomes less frequent, occasionally to the extent of five or six inspirations in a minute.*

* I may here mention the great diminution both of respiration and circulation which occurs in many diseases of the brain, accompanied by lethargy, and, also, in the torpor of animals. These, however, though they bear some analogy to it, are not genuine examples of the effect of sleep, but they serve to show how much the activity of the *animal* influences that of the *organic* life.

By the diminished frequency of respiration, a less quantity of oxygen gas is consumed in a given time, and, consequently, less stimulus produced, and thus the irritability of the muscular system is allowed to accumulate, as Dr. Marshall Hall has shewn that the degree of irritability of the muscular fibre, is inversely as the quantity of respiration.

Respiration, by being less frequent, necessarily becomes more profound, as a greater quantity of blood will be allowed to accumulate in the lungs, and will require a greater effort for its transmission.

Connected with the profundity of respiration, is the act of Snoring, which indicates some defect in, or impediment to, the due performance of that function.

This arises from a relaxation and vibration of the uvula, the velum palati, and the muscles of the larynx, owing to some obstacle to the free transmission of the air.

This may depend upon a natural narrowness of the passages, an obstruction by accumulated and viscid mucus, or a thickened state of the membrane. Thus it is very common in persons affected with catarrh, who are not usually subject to it. It is frequently observed in habitual snuff-takers, in whom the pituitary membrane, from constant stimulation, becomes of an unnatural thickness, so as to narrow the passages by which the air is transmitted, and on this account they are generally found to sleep with their mouths open. Snoring is more or less loud, according to the greater or less profundity of sleep; some individuals are never noticed to snore, while,

* See Philos. Trans.

with others, it is a constant concomitant of sleep; some only snore in the commencement of sleep, or after unusual fatigue; and others only in particular positions.

I am not aware whether any of the inferior animals have been heard to snore, or to emit any sound approximating to it, though Aristotle mentions that some have heard the Dolphin snore; "*Delphinum stertentem nonnulli audiêre;*"* which circumstance is also stated by Pliny, and even extended to whales;† "*Nam Delphini Balænæque stertentes etiam audiuntur.*"‡

The purring of the cat, though it occurs during vigilance, seems to bear the closest analogy to snoring, and depends upon the peculiar structure of the nasal passages.

Snoring has been, by general consent, considered as a matter of reproach, as indicating a dull, heavy, and stupid person; "*somno vinoque deditum;*" perhaps from having been most commonly observed in those who are devoted to their ease and the good things of life; and in fat and inactive persons, who "*stertunt noctes atque dies;*" yet it is difficult to meet with any one willing to be convinced that he is guilty of so degrading an act. There are few sounds, it must be confessed, more annoying, especially during the darkness and silence of night, than the never-ending noise of a person snoring, in every

* De Histor. Animal. lib. 4.

† Balænæ. The nature of these fish is not exactly known; they are supposed to be large fish, something of the whale species, or, as some conceive, the grampus.

‡ De Somno Animal. cap. 75.

variety of tone; and he who could discover any means of preventing it, would be entitled to no ordinary gratitude. I can, however, only venture to direct the attention of individuals to the circumstances which may appear to have caused it, and to intimate that, by avoiding or removing them, they may, perhaps, counteract the tendency to it. As a general rule, that position ought to be selected in which the lungs are found to expand most freely, and every unnecessary weight, by bed-clothes, ought to be avoided; and it would be a much better plan that they should be only single, instead of being folded double over the chest, as is the usual method, and thereby placing an obstacle to the free motion of the lungs, and increasing, at the same time, the heat of the chest beyond that of the rest of the body, and, consequently, rendering it more susceptible of injury from change of temperature. The nature of the exciting cause must point out the remedial measures which are most appropriate.

PART IV.

Medical Jurisprudence.

AN ATTEMPT TO ASCERTAIN, BY EXPERIMENT, THE EXACT DIFFERENCES BETWEEN THE CHANGES PRODUCED IN THE LUNGS OF STILL-BORN CHILDREN, BY THEIR ARTIFICIAL INFLATION, AND THOSE PRODUCED IN THE LUNGS OF NEW-BORN CHILDREN, BY NATURAL RESPIRATION.

BY EGERTON A. JENNINGS, F. L. S.

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MANY members of this Association have, no doubt, been called upon to give evidence in courts of justice, in cases of supposed infanticide; and, probably, in cases where, from the absence of general evidence, the conviction or acquittal of the prisoner has rested solely on the testimony of the medical witness. Such individuals must, I think, have felt, with myself, the unsatisfactory nature of that part of the enquiry, by which it is attempted to ascertain whether the floating of the lungs, in the hydrostatic test, results from respiration or artificial inflation. The tests generally laid down, for ascertaining whether lungs float from putrefaction or respiration, appear

to me to place an accurate decision, on that point, within the reach of any careful enquirer; but I must confess, that the information I had been able to gain, from books, did not give me confidence in my power to decide whether a child had respired, and come to its death from the negligence or criminal violence of the mother; or whether the floating of the lungs resulted from the anxious efforts of a kind parent, striving to animate her infant child; or the malicious act of a cunning neighbour, willing to sacrifice a fellow creature.

To solve these doubts, the following experiments were commenced. To some extent they throw light upon the subject, though I am fully aware that, in an enquiry of so grave a nature, it would have been desirable that the experiments should have been much more numerous. They were commenced under circumstances favourable for investigating the subject, and would not have been presented to the profession until confirmed by many more repetitions, had I still possessed the same means of continuing the enquiry. As it is, they are presented to this "Association," with hopes that some of its members, favourably circumstanced for such enquiries, may be induced to continue the investigation, and to communicate the result of their observations through the medium of its "Transactions." Should such experiments lead to the discovery of more certain means, than here pointed out, for distinguishing the effects of respiration from those of artificial inflation of the lungs, none will be more rejoiced than myself.

In the absence of more extensive observations on the subject, should those I now record tend to re-

move from the minds of others the doubts which I have myself felt, while engaged in investigations involving the life of a fellow creature, my object, in submitting to this Society the following remarks, will be fully answered.

The valuable edition of "Beck's Medical Jurisprudence," edited by Dr. Darwall, perhaps contains the best article, on infanticide, we possess. In that article, the difficulty I have felt, on this subject, is thus fairly treated :

"It has been objected, that a child may have been born dead and yet the lungs may float in water, in consequence of their having been artificially inflated ; and therefore it is argued, the mere floating of the lungs is no proof of previous life."

It is considered, by the author, that the state of the lungs after respiration, may be distinguished from that induced by artificial inflation, by three methods.

1st. By the full or empty state of the arteries of the lungs.

2nd. By M. Ploucquet's celebrated test, comparing the weight of the lungs with that of the body.

3rd. By a test proposed by M. Beclard, who asserts "that the lungs of a child which has not respired, but which float in consequence of artificial inflation, may be deprived of all the air introduced into them, preserve their original density, and sink in water." The author expresses his inability to decide whether or not this last test can be relied upon.

The first test did not, I confess, prove satisfactory to me ; for, on examining the pulmonary vessels, to ascertain whether they were full or contracted, I had

found these vessels containing different quantities of blood, in different cases; and was at a loss to know what was the comparative degree of distention before and after respiration.

Subsequent remarks on Ploucquet's test, in the same work, point out, clearly, that whatever may be the relation between the weight of the lungs, and that of the whole child, his proportion is not correct. Thus was the second test rendered unsatisfactory.

The third test alone remained, and the author himself appeared doubtful whether that test be worthy of confidence.

I, therefore, determined, on commencing a series of experiments, to ascertain what reliance could be placed on M. Beclard's test, and the circumstances necessary to be observed to obtain satisfactory results; and also the precise difference in the pulmonary vessels before and after respiration.

Before commencing these experiments, I fortunately met with the following paragraph, in the Edinburgh Medical and Surgical Journal,* extracted from Professor Brent's work on the tests for determining whether or not a child has been born alive, which I am surprised at not seeing noticed in the popular works on medical jurisprudence, published since those remarks appeared:

"In the fœtus, the arterial duct proceeds from that part of the trunk of the pulmonary artery where it divides into two great branches, and running parallel with the arch of the aorta, and in contact with it, joins it at a very acute angle. If the child has breathed, even for a few moments only, the aperture

* For October, 1826.

by which the duct enters the aorta becomes oval; and, afterwards, the diameter gradually, but rapidly, contracts at the aortal end, so that the vessel forms a cone, with its base towards the pulmonary artery. If the child has breathed several hours, or days, it resumes its cylindrical form, but becomes all much contracted and shorter; so that, from being equal in diameter to the pulmonary trunk, it becomes intermediate between that and the pulmonary branches, or, even, not larger than the latter. If the child has lived above a week, it is wrinkled, and no thicker than a crow quill, while the pulmonary branches are, at least, as large, and the pulmonary trunk as thick as a goose quill."

In conducting the following experiments, my attention was, of course, directed to ascertain how far Profesor Brents' test might be relied upon; or, in other words, whether the comparative size of the pulmonary arteries and ductus arteriosus varied in the proportions he represents.

November 23, 1826.—I examined the body of a still-born child, and, at the time, made the following notes of the appearances observed.

The lungs do not cover the pericardium; they are of a dark chocolate colour, and occupy only the posterior part of the thorax. Since their exposure to the action of the air, the lungs have rapidly changed their colour, gradually approaching to a bright scarlet hue. That portion of the lungs, however, which has been defended from the action of the atmosphere, (by being immersed in fluid at the back part of the chest,) still retains its dark colour.

The diaphragm is much arched. The ductus arteriosus is much larger than either of the pulmonary branches, and nearly as large as the pulmonary trunk: it is not of a conical form, but of equal diameter throughout: its termination in the aorta seems disposed to assume a circular form, but by drawing the vessel a little to either side, it can easily be rendered oval, and it retains that shape until again moved The right pulmonary artery is a little larger than the left. There is a considerable quantity of fluid in the cavities of the pleura and pericardium.

Experiment 1.—On removing the lungs, with the heart and large vessels attached, and placing them in water, they sunk quickly to the bottom of the vessel, the heart being the uppermost part when allowed to descend in the position they naturally assumed.

Having separated the lungs from the heart and larger vessels, and again placed them in a basin of soft water, they sunk rapidly. I then introduced a pipe into the trachea, and inflated them; on again placing them in water, they floated on its surface; indeed, with a considerable portion of their substance above the level of the water. I next placed the lungs in a piece of linen cloth, and, with the aid of an assistant, twisted the cloth, (in the manner washer-women call wringing,) so as to expose them to violent pressure. On placing them again in water, I found that they still floated, though with only a very small portion of their substance above its surface.

I next made numerous incisions into the substance of the lungs, and again subjected them to violent pressure, both by twisting in a cloth, and by placing them under a board loaded with weights; but after this they still continued to float when placed in water.

I then took portions of the lungs in the palm of my hand, and, with the thumb of the opposite hand, endeavoured to squeeze the air out of them, and, with some trouble, succeeded in reducing the parts thus treated, to a pasty substance. On placing these portions in water, they all sunk, not leaving a particle floating.

January 23, 1827.—I examined the body of a still-born child, ninety hours after birth; it was a premature child, having been born at about the termination of the eighth month.

On examining the thorax, I found both lungs very small and much compressed; the left was so much covered by the heart and pericardium, as to be nearly hidden from view; they were both dark coloured, and there was a good deal of fluid in the cavities of the pleura and pericardium. The diaphragm was much arched.

Experiment II.—I removed the lungs, together with the heart and its large vessels, and placed them in a basin containing soft water, when they sunk rapidly, no one part appearing to be drawn down by the weight of the others, but all appearing equally inclined to sink. I then removed the heart and its large vessels, leaving only the lungs and a small portion of the trachea, and again placed them in water, but they still continued to sink as *rapidly* as

before. I next introduced a pipe into the trachea, and, by blowing through it, inflated the lungs. When thus inflated, they rapidly changed their colour, passing, in a few minutes, from a chocolate to a bright scarlet hue. I now placed them again in water, when, instead of sinking, as they had done before, they floated with a considerable portion of their substance above its surface.

I next folded them in a strong linen cloth, and, with the aid of an assistant, twisted the two ends of the cloth in opposite directions, thus exposing them to considerable pressure. On placing them again in water, they still continued to float, though only just at its surface. I placed them, also, under a board loaded with weights, but this produced no effect upon their floating.

I then cut the lungs into several pieces, and, folding them in a cloth, again exposed them to violent pressure, by twisting it. On putting these pieces now into water, they all floated, with the exception of one or two small portions, which were reduced to a kind of paste, and sunk to the bottom of the vessel.

The remainder of the lungs I placed in the palm of my hand, and, by kneading it with the thumb of the opposite hand, as in the last experiment, soon succeeded in reducing it to a pasty substance, which sunk to the bottom of the vessel.

On examining the heart, I found a good deal of dark-coloured coagulated blood in the right auricle; there was, also, a small quantity of dark-coloured blood in the left. The ductus arteriosus was quite open, much larger than either of the pulmonary branches, and almost as large as the pulmonary

trunk; it contained a small quantity of coagulated blood. With regard to the termination of the ductus arteriosus in the aorta, I could not form any decided opinion on the form of the orifice, as it could be made to appear either oval or round, by slightly moving the vessel. The diameter of the duct was the same throughout its course.

April 12, 1828.—Forty-eight hours after birth, I examined the body of a mature male infant, whose movements had been felt two hours before birth, but which was still-born.

No tube being at hand, the nostrils were compressed between the thumb and finger, the lips applied to the child's mouth, and air forcibly driven into the chest. No appearance of animation was, however, produced either by this or any other means employed.

Experiment iii.—The lungs were scarlet, filled the cavity of the chest, and crepitated when pressed or cut, with the exception of the tip of the inferior lobe of the right lung, and the inferior lobe of the left lung, which portions were of the colour and consistence of liver.

On placing the lungs in water, with the heart and large vessels attached, they would not float, and yet sunk so very slowly, that they seemed almost suspended in any part of the fluid where placed. When the heart was separated, they floated, but with scarcely any of their substance above the surface of the water. However placed in the water, the lower part of the left lung always turned under, so as to become the lowest part.

The portions of lung which presented the liver-like appearance, were cut off, and found to sink.

The other parts were submitted to pressure, by twisting them in a cloth, as in experiments, 1 and 2. After this they floated. They were then, as in the former cases, kneaded with the thumb in the palm of the hand, by which they were, with little difficulty, reduced to a pasty mass, which descended, rapidly, to the bottom of the vessel. There was not, in this case, nearly so much difficulty in making the lungs sink, as in experiments, 1 and 2.

The ductus arteriosus was much larger than either of the pulmonary branches, and of the same diameter throughout.

October 16, 1827.—I examined the body of a male child, which died about an hour after birth. It had cried and breathed freely. The examination took place four days after death.

The lungs, which were of a scarlet colour, filled the chest and covered the sides of the pericardium. They floated, with the heart and large vessels attached, a portion of their substance being above the surface of the water.

Experiment iv.—The lungs were placed in a strong cloth, and twisted as firmly as possible with the aid of an assistant; they floated after this pressure.

They were cut into slices, and several of the portions submitted to pressure in like manner; these, also, continued to float.

I then pressed and rubbed them in the palm of the hand, as already described, reducing them to a pulpy mass; still they continued to float, and would not sink until their entire structure was completely

broken down, and the whole reduced into a state of rags; when thus reduced, the greater part of the lungs sunk. Still the surface of the water was covered with minute particles of pulmonary tissue, which had detached themselves from the general mass when they were repeatedly placed in the water to ascertain whether they would still float; some, also, had detached themselves from the portions that had been made to sink. No portion, probably, was larger than a shot, and most of the particles were much smaller: these, when taken from the surface of the water, required the same destruction of their substance as the larger pieces, to make them sink. After all my pains to make the whole of the lungs sink, a few small particles continued to float about the fluid.

Several small portions, after they had been reduced to rags and made to sink, on removal from the water, regained their buoyancy in a few seconds, and again floated.

The pulmonary branches were larger than the ductus arteriosus, which was conical, with its apex towards the aorta.

March 12, 1827.—I examined the lungs of a lamb which died about twelve hours after birth, as was supposed, in consequence of the mother lying on it; for, about two hours before its death, it appeared very strong and healthy. At the time of the examination, the lamb had been dead nine days, but the lungs were perfectly free from putrefaction, crepitating when pressed or cut, and of a bright scarlet colour. The ductus arteriosus was smaller than either of the pulmonary arteries, and was contracted

towards its aortic orifice; its openings into the aorta and pulmonary trunk, each had a puckered appearance. The foramen ovale was closed by a transparent membrane, with the exception of a hole, about the size of a pea, at its upper part.

Experiment v.—The lungs, when placed in water, with the heart and large vessels attached, floated with a considerable portion of their substance above the surface of the water. When cut into slices, every portion continued to float.

Pressure upon these divided portions, by twisting them in a cloth, did not interfere with their buoyancy.

Squeezing and kneading the lungs in the palm of the hand (as done in the former experiments) did not prevent them from floating, even though the process was carried so far as to break down their substance into rags; but by persisting in pressing and tearing them, so as completely to destroy their organization, the greater part was made to sink, though every particle, the structure of which was not completely broken down, even if as small as a pin's head, continued to float; indeed, notwithstanding all my efforts to make the whole of the lungs sink, a large quantity of such minute particles continued to float upon the surface of the water.

The portion of the lungs nearest to the root bore the most pressure before it would sink; and, even after having been made to sink, it more than once regained its buoyancy, so as to float again. Several pieces of the lungs which had been made to sink, on being removed from the water and allowed to remain exposed to the air for a short time, regained their buoyancy, and again floated.

June 21, 1827.—I examined the body of a child that died soon after birth. It had never been vigorous. Four days had elapsed since its death.

The lungs were of a mottled scarlet colour, covering the sides of the pericardium. The right side of the heart was filled with purple blood. The thymus gland large. The cavities of the pleura and pericardium contained a small quantity of fluid.

The ductus arteriosus was conical, with its base towards the pulmonary trunk. It was smaller in size than either of the pulmonary branches, and presented, towards the aorta, an oval, puckered appearance. It was quite pervious throughout, and its opening into the pulmonary artery was larger than that into the aorta.

There was a fine transparent membrane extending partly across the foramen ovale, but not completely closing it.

There was no air under the pleura from decomposition; indeed, the lungs appeared quite free from putrefaction.

Experiment vi.—The lungs crepitated when pressed or cut. On being placed in water they floated freely, and continued to do so after exposure to pressure by twisting in a cloth, with the exception of a small portion of the left lung, which appeared to be gorged with blood.

On cutting the lungs to pieces, and subjecting the parts to pressure in the palm of the hand, they sunk when reduced to rags, but this reduction was not effected without great trouble. As in experiments, 4 and 5, small portions remained floating on the surface of the water after the bulk had been made to

sink, which were, with great difficulty, made to sink also.

January 7, 1828.—I examined the body of an infant, which died under the following circumstances.

The breech presented, and the child, when born, was in a state of asphyxia, but the umbilical artery pulsated. An elastic eatheter was introduced into the child's mouth, which being closed and the nostrils compressed, the lungs were inflated by blowing air through the catheter. Respiration being but imperfectly established, a pan of warm water was placed on the bed, that the child might be immersed in it before the funis was cut. During the immersion, the respiration rapidly improved, and the child cried. While thus occupied with the child, the placenta was suddenly expelled, and considerable flooding came on. This took attention for a short period from the child; on again looking to which, it was found that the nurse had, in her hurry, allowed it to sink completely below the surface of the water, in which situation it had probably been for half a minute. It was, of course, immediately removed from its perilous situation, and every effort made to re-establish respiration, which, in some measure, succeeded, but so imperfectly, that in half an hour afterwards it died.

The body was examined twenty-four hours after birth.

The right lung, scarlet and crepitating throughout, quite filled the right side of the chest. The left lung mostly presenting the solid substance and dark colour of liver, and not covering the left side of the pericardium. The upper part of the left lung crepitated, and presented a scarlet hue.

Experiment vii.—When the heart and lungs were placed in water, they sunk, the right being uppermost, and evidently drawn down by the weight of the other parts.

On separating the heart the lungs swam, but with no portion above the surface of the water. The left lung always turned under, in whatever position they were put in, and was evidently supported by the right.

On separating the two lungs, the right floated with a considerable portion of its substance above the surface of the water. The left sunk to the bottom.

After twisting the right lung, with the aid of an assistant, in a strong cloth, it still continued to float. When cut into pieces and similarly treated, the result was the same.

The divided portions of lung were then successively submitted to pressure in the palm of the hand, in the same manner as in the former experiments. Yet they could not be made to sink without entirely breaking down their substance, and, as in experiments 4, 5, and 6, any small portions which had escaped this destruction, continued to float on the surface of the fluid.

On dividing the left lung into portions, a small part about its root floated. This continued to float after twisting it in a cloth, but when reduced, by pressure in the palm of the hand to a pasty mass, it would not float; and this change was effected with much less difficulty than in any portion of the right lung.

The right pulmonary artery was as large as the ductus arteriosus. The left pulmonary artery was much smaller than the duct. The ductus arteriosus was considerably smaller than the pulmonary trunk, and conical.

From the above experiments, the following conclusions may be fairly drawn :

1st. That artificial inflation will dilate the lungs, so that they will float in water and crepitate on pressure ; and will, at the same time, change their colour from chocolate to bright scarlet.

Experiments, 1, 2, and 3, fully prove these points. In all these experiments the lungs were found to float and crepitate. In experiment 2, the change from chocolate colour to scarlet was observed to take place immediately after inflation. That the change in colour may be produced by the air driven into the air cells, without exposure to the atmosphere, is proved by experiment 3 ; in which the scarlet colour was observed immediately on opening the chest, and before the external air could have produced any effect.

2nd. That this inflation may be effected without the aid of instruments, by merely blowing air into the child's mouth.

This has been doubted by some. That such inflations may be effected is proved by experiment 3. It is by no means difficult to inflate the lungs to some extent in this manner, if the nostrils be closed, and the lips closely applied to the child's mouth. Whether the mother of an illigitimate child would be likely to make such efforts to reanimate her infant may be doubtful, yet, as some mothers would

probably have a disposition to do so, every individual ought to have the credit of such motives, lest by any chance an innocent person should suffer.

3rd. Air introduced into the lungs, by artificial inflation, may be expelled by pressure, so that the lungs will sink in water.

This is proved by experiments 1, 2, and 3. In each experiment is detailed the degree of pressure requisite to effect this object. It will be observed, that in experiment 3, where the lungs were inflated from the mouth with the greatest care, there was much less difficulty in depriving them of their air, than in experiments 1 and 2. This, no doubt, arose from their being less perfectly inflated; for, in experiments 1 and 2, a tube was introduced into the trachea, and, by a great effort, every cell probably was distended, and here, also, the whole force of a powerful expiration could be directed to the purpose, and no opposition existed from the walls of the chest. Yet, even, in these cases, the whole air was expelled, and the lungs assumed a pasty character, though some difficulty was experienced in effecting this change.

4th. After respiration, the air cannot be expelled from the lungs without completely breaking down the structure of every part of the organ. Any part, however small, not thus broken down, will continue to float.

Experiments 4, 5, 6, and 7, appear to justify this deduction. In all these experiments it will be observed, that any particle of lung, however small, the structure of which was not destroyed, continued to float. This, certainly, in the first instance, appears

a surprising result, for it might naturally be doubted whether so much difference could exist between two cases, where the distention of the air cells was equally complete ; and, certainly, in experiments 1 and 2, the inflation was as complete as possible. A little consideration will, however, explain the cause of this difference in the result. If we could imagine a bladder filled with empty leather tubes, having their sides compressed together, we should have a structure somewhat similar to the lungs of infants before birth : if these tubes, while still remaining in the bladder, were to be distended with air, we should have a similar structure to the same organs artificially dilated : if, after this distention, we could suppose a cement run into all the interstices formed between these distended tubes, we should have a structure corresponding with the lungs after respiration. In fact, after respiration, we have canals excavated in solid substance ; after artificial inflation, we have membranous tubes in simple contact. To empty the former, the solid structure surrounding the canals must be destroyed ; while the latter may be emptied by again bringing the sides of the tubes into contact, without a total destruction of substance. In the former, to use the language of builders, the arches are "backed up ;" in the latter, they have no support. That this difference does absolutely exist will be evident to all, who remember that, from the moment respiration commences, all the blood of the body circulates through the lungs ; and that the vessels through which it circulates being thus distended, must fill the spaces between the bronchial tubes and air cells.

I can conceive that subsequent experiments may show that, when imperfect respiration has taken place, the lungs may be made to sink without such complete destruction as is here represented; the parts in which perfect respiration has taken place being drawn down by those in which it has either not existed, or been imperfectly performed. Such cases take little from the value of the test. It is not against puny children, imperfectly performing this important function, that the destroying hand will probably be raised. Hope will be entertained that each imperfect gasp will be the last; and a mother will scarce lift a hand against her own child, when natural causes alone seem likely to destroy it It is against a strong and vigorous child, whose lusty cries cause fear of detection, that the hand of violence is generally directed. Besides, if any error do occur, it will be in favour of the prisoner, and, therefore, less to be regretted than one which might bring a fellow-creature to an unjust and ignominious death.

Probably in immature children, the structure of the lungs may be found to break down, as easily as the air cells can be emptied after complete inflation, in mature ones. I am induced to think that such may be the case, from some experiments I have made on young kittens, which have been destroyed a few minutes after birth. In them I have found that though no portion of the lungs will sink before the structure has been destroyed, yet the texture of the parts is so soft, and so easily destroyed, that little trouble is required to effect that object. Should future experiments confirm my conjecture, still it

would be a weak argument against the practical application of the test. No jury would convict a woman of infanticide in a case where the child was far from maturity, without *prima facie* evidence of the fact, and here the medical evidence as to the child's respiration would be needless.

If we compare together the experiments, 1 and 7 —the least perfect natural respiration with the most perfect artificial inflation,—the marked difference between the two results will be obvious to all. But if we compare experiment 3 with experiment 4,—a case of the most perfect artificial inflation while the lungs were in the chest, (for the lungs were most carefully inflated in this case, these experiments being at the time in view,) with a fair specimen of natural respiration,—the difference is too marked to allow them, for one moment, to be confounded together. I am far from thinking that a mother could inflate lungs to the same extent as in experiment 3, though that she might do so to some extent, I do not doubt; while in experiment 4, the respiration was by no means remarkably vigorous, and, in cases of child murder, would probably seldom be less complete. The difference between the two cases could, therefore, seldom be less marked than it was in these, and considerably less difference would be amply sufficient to distinguish the two cases.

5th. Before respiration, the arterial duct is of equal diameter throughout its course, considerably larger than either of the pulmonary branches, and nearly as large as the pulmonary trunk.

As far as these experiments go, they fully confirm the above statement, which corresponds with what Professor Brent states upon the subject.

6th. After respiration has been established, the arterial duct becomes conical, the apex of the cone being towards the aorta; it is, also, considerably smaller in size than the pulmonary trunk, and one or both of the pulmonary branches will be found, in diameter, nearly equal to, if not exceeding it.

In experiment 7, where respiration had evidently existed in one lung only, it will be observed that one pulmonary branch had increased in size, while the other remained much smaller than the ductus arteriosus. Imperfect as the respiration was in this case, yet the conical form of the duct, and the right pulmonary branch being as large as the duct, showed the changes effected by respiration in these parts, with sufficient clearness to leave no doubt on the subject of its having taken place. My observations do not accord with Professor Brent's on the appearance of the orifice at the termination of the ductus arteriosus in the aorta. He states that if a child have breathed but for a few moments, the aperture becomes oval. I have not been able to satisfy myself on this point. In experiments 1, 2, and 3, when respiration had not taken place, it was impossible to say whether the aperture were round or oval; and in cases where it had existed, I have found the same difficulty in deciding on its form. Until respiration has existed for some time, when the aperture becomes puckered, (as in experiments 5 and 6,) I confess my inability to decide on the form of the opening, from the facility with which it may be made to assume either a circular or oval shape.

7. If immediately on opening the chest of an infant, the lungs be found of a bright scarlet colour,

filling the cavity of the chest, covering the sides of the pericardium, and crepitating when cut or pressed—if they float freely in water, and portions continue to do so until the disorganization of every part be effected, there can be little doubt that respiration has taken place. If, in addition, the ductus arteriosus be conical, considerably smaller in size than the pulmonary trunk, and but little differing in size from the pulmonary branches, the fact of respiration having taken place may be considered as positively proved.

Whatever objections may be made against either of the two tests, when employed separately, they are entirely removed when the result of both proves the same thing. Future experiments may prove, either that, where death has taken place while respiration is very imperfect, or where the infant has been immature, one or both of these tests may fail to indicate the fact of respiration having existed. Still such cases can in no way affect the validity of the test, as proving respiration to have existed, where the results are such as I have pointed out. Future experiments may, and I trust will, disclose means by which the most imperfect respiration may be distinguished from artificial inflation; though, nevertheless, I am of opinion that, for practical application to the ends of justice, the above means will be found amply sufficient.

PART V.

Reports of Infirmaries and Dispensaries.

REPORT OF THE BIRMINGHAM INFIRMARY FOR DISEASES OF THE EYE,

FROM JANUARY 1, TO DECEMBER 31, 1833.

BY MR. MIDDLEMORE,

Assistant Surgeon to the Eye Infirmary, &c.

Simple acute conjunctivitis, 230. *(a)* Chronic conjunctivitis, 112. Acute conjunctivitis, with pustules on the conjunctiva, 123. Acute conjunctivitis, with pustule or ulcer of the cornea, 124. Acute conjunctivitis, with puriform secretion, 87. Purulent conjunctivitis of newly-born infants, 41. Irritable conjunctivitis, 44. Strumous conjunctivitis, 70. Pterygium, 7. Corneitis, 13. Vascularity of the cornea, 11. Opacity of the cornea, 149. Conical cornea, 5. *(b)* Staphyloma of the cornea, 12. Impaction of foreign bodies in the cornea, 17. Simple acute sclerotitis, 4. *(c)* Rheumatic sclerotitis, 11. Staphyloma of the sclerotica, 4. Morbid attenuation of the sclerotica, without distinctly-formed staphyloma, 3. Affections of the membrane of the aqueous humour, 14. Simple acute iritis, with or without ulcer or opacity of the cornea, onyx or

hypopion, 47. Chronic iritis, 9. Syphilitic iritis, 6. Strumous iritis, 7. Prolapse of the iris, 6. Fungus from the iris, 5. Vacillation of the iris, 5. Cataract, 17. *(d)* Dislocation of the lens, 15. Choroiditis, 7. Retinitis, 2. Glaucoma, 4. *(e)* Hydrophthalmia, 2. Suppuration of the eye-ball, 7. Atrophy of the eye-ball, 3. Fungoid, and various anomalous tumours of the eye-ball, 4. Neuralgia of the eye-ball, 7. Oscillation of the eye-ball, 5. Amaurosis of various kinds and degrees, 100. Diseases of the lachrymal passages, 19. Epiphora, 14. Strabismus, 8. Tinea, 105. Lippitudo, 12. Hordeolum, 5. Ectropium, 3. Entropium, 6. Inflammation of the eye-lids, 16. Œdema of the eye-lids, 9. Ulceration of the eye-lids, 6. Ptosis, 4. Adhesion of the eye-lid of the globe, 3. *(f)* Tumours in the eye-lids, 27. Wound of the eye-ball and its appendages, 42.

Disease of, or changes in, the tarsal cartilage, as connected with chronic conjunctivitis.

(a) Several obstinate cases of chronic inflammation of the conjunctiva, depended on a shrivelled, uneven, and irregularly ossified state of the tarsal cartilage, and, although not absolutely curable, were yet capable of considerable alleviation by appropriate treatment. In very old persons, changes in the figure, the size, the consistence, and other characters of the tarsal cartilage, frequently take place, and, among these alterations, the undue incurvation of its extremities, or a shrivelling of its texture, with the deposition of specks of ossific matter, are the most common; and, of course, any

material irregularity of surface or change of figure it may undergo, will influence the surface and condition of the palpebral conjunctiva which covers it, and produce certain effects upon the eye, correspondent, in their extent, to the changes the conjunctiva may have sustained. In a case of tumour of the eye-lid which I recently attempted to remove, I was surprised to find that it consisted of a mass of cartilaginous matter, deposited upon the cutaneous aspect of the tarsal cartilage ; it was, in fact, nothing more than a great and irregular enlargement of that part.

I am induced to allude to these morbid states of the tarsal cartilage, as causes of chronic conjunctivitis, because, though by no means of very frequent occurrence, they still are such as we are, for the most part, unable to remove, (unless, indeed, we extirpate the morbid part, which, if it do not excite most serious mischief, would be a very exceptionable proceeding,) and, consequently, the disease to which it gives rise, will surprise by its obstinacy, and falsify any prognosis which may have been given in reference to its curability, founded on an acquaintance with the usual influence of treatment upon chronic conjunctivitis, not associated with a cause of so irremediable a character.

Staphyloma.

(b) Among many cases of staphyloma of the cornea, requiring the adoption of surgical measures, I may relate the following, as illustrative of the advantages of a description of operation which I have now

practised for several years, and which I believe to be quite as efficacious, and certainly far safer, and much less painful, than those generally employed. It will be perceived that the operation I am about to describe, is but a slight modification of the practice recommended by Scarpa, Guthrie, Travers, and Mackenzie, for the cure of *certain forms* of staphyloma, but I believe it admits of much more extensive application than is involved in their recommendation, and that, in fact, it may advantageously supersede almost any surgical operation performed for the removal of this troublesome malady.

Case.—Sarah Mace, æt. 20, residing at Lower Trinity-street, Deritend, has a large spherical staphyloma of the left cornea, consequent on an attack of gonorrhœal ophthalmia. The diseased eye-ball is somewhat inflamed, and the opposite eye is in a very irritable state.

Operation.—Having placed her upon a table as for the operation of extraction, I introduced Beer's knife, at about an equal distance from the summit and base of the staphyloma, and brought out its point at a corresponding situation on the opposite side, and by gently urging the knife forward, a small semicircular flap was formed, which was immediately removed by the convex-bladed scissors, by an incision which constituted, as respects its outline, a portion of morbid cornea, of an equal size, and of the same form. The lids were then carefully closed, and a roller so applied as to keep them in apposition with the globe.

The operation occasioned very little pain; no bad symptom followed its performance, and in the

course of a few days the opening in the cornea had closed, chiefly by the adhesion of its edges to a small portion of lymph in the centre. As this lymph became absorbed, the part diminished in magnitude, and, at the present time, the previously staphylomatous eye is smaller than the opposite and healthy globe, which is partly owing to the partial absorption of the morbid cornea, a circumstance which generally takes place when a portion has been removed from its centre for the cure of staphyloma.

Remarks.—I did not, in this case, bring the divided edges of the cornea into contact, as suggested in my last report, but I have done so in several instances; and where the eye-ball is much enlarged, and the divided edges lie widely apart, it is most desirable to do so, for the purpose of preventing the reproduction of the malady, of obviating the occurrence of acute inflammation of the exposed interior of the eye-ball, and, also, of diminishing the risk of staphyloma, which is apt to occur if the interior of the globe becomes filled with fresh secretion, before the matter of reparation possesses a sufficient degree of firmness to resist the pressure from within.

With respect to the general treatment of staphyloma, I shall only remark, that partial excision is far preferable to the use of escharotics, as advised by Richter, Beer and Vetch; to the removal of the morbid projection, by the aid of ligatures, as recommended by Nelsus, Banister, St. Yves, and Dionis; and to the total excision of the prominent part, as suggested by Woolhouse, Sabatier, Lawrence and Frick.

Rheumatic Sclerotitis.

(c) I am often surprised at the frequency with which the characters of rheumatic sclerotitis are overlooked, and the length of time this disease is allowed to continue, from omitting to detect its cause. Even where the local symptoms, the absolute condition and appearance of the eye itself, are not so well marked as usual, yet, if the inflammation is obstinate, the pain intense and somewhat periodical, the eye-ball not being particularly vascular, and the deep-seated textures being unaffected with any evident acute inflammation, I am in the habit of recommending the following treatment, as my general method, with the most decided advantage, and I have, sometimes, had the credit of removing, with great rapidity, a previously prolonged and unyielding disease. An active cathartic is first prescribed, and, afterwards, a few grains of calomel and Dover's powder, to be taken every night at bed time, and three or four grains of quinine about thrice daily. A small quantity of the strong mercurial ointment, blended with a grain of opium, is directed to be rubbed above the eye-brow, about the situation of the supra-orbitary nerve, every evening, if the pain in the eye-ball and orbit is intensely severe.

If these remedies fail to afford material relief, I then direct about half a drachm of the wine of colchicum to be taken three times a day, and, also, two pills in the evening, consisting of five grains of blue pill, and six of the extract of conium.

By due perseverance in this plan of treatment, with, of course, the aid of other adjuvants, such, for

example, as poppy fomentation, or one of hops, an aqueous solution of opium, &c. I am not often foiled in my attempts to cure this truly painful malady.

Of course, instances will occur which will not yield to this plan of treatment; but it would be improper for me to do more, in a brief notice such as this, than point out, in very general terms, the means which are usually adopted, and with great success.

Dislocation of the lens.

(d) During the past year, there have been in attendance many persons suffering from dislocation of the lens; and I have separated these cases from "wounds of the eye-ball and its appendages," (which will be found at another part of this report): first, because the nature of the accident is definite and capable of separate arrangement; and, secondly, because it sometimes takes place without any blow upon, or wound of, the eye-ball. It must be remembered, that this accident may be simple or complicated; and that the symptoms to which it may give rise will be influenced by very many occurrences, and, perhaps, by none more than by the circumstance of its being covered by, or fed from, its capsule. It would be out of place to enter into a *minute detail* of the various forms of injury with which dislocation of the lens may be combined; and it would be equally improper to engage in a *detailed account* of the treatment which may be suited to its different combinations; but it may not be, altogether, uninteresting, to point out the general mode

of practice which it is usual to adopt for the relief of the more common cases of this description.

It may happen that an adult patient presents himself at the infirmary, who, after sustaining a severe fall upon the head or concussion of the body, or after some violent straining effort, may have perceived a dimness of vision,* and uneasiness and inflammation of the eye-ball. On carefully examining such an eye, it will, very probably, be found that the lens is slightly opaque, that it is pressed, but not forcibly, against the iris; and that there is some degree of external ophthalmia, with a slight zonular arrangement of vessels around the cornea. Now, in such a case, I am aware that different treatment would be adopted by different surgeons; some would directly remove the lens; others would employ measures for the relief of the inflammation merely; and many would, no doubt, first lessen the inflammation, and then extract, or endeavour to break up, the lens.

Of course, in the first mode of procedure, the surgeon operates upon an eye at a time, when it is most unfavourably circumstanced for such a proceeding; and as the symptoms are probably not urgent, and the patient by no means convinced that vision is destroyed, or that there exists any decided necessity for an operation, he will be much disposed to censure the operator, should he be unsuccessful in his attempts to restore vision. I need not say what is likely to be the average result of operations for extraction, when performed upon eyes in a

* The dimness of vision may, of course, depend on *concussion of the retina*, and may not be owing to the displacement of the crystalline.

state of acute inflammation. Inasmuch, therefore, as the organ of vision has sustained the first effects of the injury, and inasmuch as the inflammation is by no means solely dependent on the continuance of the displaced lens, I deem it most improper to perform a surgical operation at this stage of the injury, unless, indeed, the eye be unusually painful, or the patient suffering from those rare forms of dislocation of the lens in which the crystalline body is forced upon the retina.

To the second mode of treating this description of injury, that is, by simply removing the inflammation, and allowing the lens to be absorbed by the natural efforts; or, at all events, not incurring the risk connected with the performance of a surgical operation for the removal of the lens: there are certain objections which I shall very briefly mention. In the first place, after the acute inflammation connected with the immediate occurrence of the injury has taken place, the pressure of the lens may effectually maintain it, and this is the more likely to happen if the iris be *forcibly* compressed between the crystalline body and the cornea; and, besides, the lens may not be absorbed, (and this is the more likely to happen if it be surrounded by its capsule,) but, instead of being so, a quantity of lymph may be effused from the inflamed iris, which will have the effect of closing the pupil, or, at all events, of rendering the subsequent restoration of vision by any means short of a surgical operation, absolutely unavoidable. And, again, the continuance of this chronic inflammation of one eye, will be likely to excite a tendency to a similar description of oph-

thalmia in the other, and thus endanger the absolute possession of vision. This view of the subject, combined with a knowledge of the evils connected with an invariable adherence to any specific rule in these cases, suggests the propriety of the following, or the third, plan of treatment mentioned in these remarks, that is, the subduction of the immediate acute symptoms, and the subsequent removal of the lens, if it have not been absorbed, provided it constitute, in the patient's estimation, a sufficiently objectionable personal blemish, or if it should much augment the severity, or greatly prolong the existence, of inflammation.

2. Hitherto I have been supposing that the lens has become displaced, without any blow upon or wound of the eye; but when the dislocation of the lens is associated with any such injury, then, of course, the particular nature of the associated injury must be taken into consideration; and, I think it may be stated, *as a general rule*, that, in such complicated cases, it would be unnecessary, useless, and injurious, to attempt the extraction of the lens. If the accident producing the dislocation be of a violent nature, the existing inflammation will be excited, not by the dislocated lens, but by the injury which caused its displacement. The dislocation of the lens, and the inflamed condition of the eye, are, in fact, excited by one and the same cause.

3. There is one other variety of dislocation of the lens, to which I shall, for a short time, direct attention; and it will afford me great pleasure if my brief allusion to it, should induce surgeons of greater experience, to favour the profession with

their opinion, of a condition of disease which is sometimes adequate, to render the subject of it a burdensome and comparatively useless member of society.

A blow upon the eye may displace the lens and its capsule, and, at the same time, rupture the hyaloid membrane; or it may inflict such injury upon these parts, that the septa of the hyaloid membrane may become absorbed, and the vitreous humour acquire a morbid fluidity, so that the lens will sink backwards and rest upon the retina, and, by its compressive effect, cause total amaurosis. Now, in such instances, an examination of the eye, with the head reclined backwards, will detect a vacillating iris, and a slightly green-coloured body, (which is the most common change of colour that the lens undergoes under such circumstances,) at the lower and posterior part of the globe; and, whilst in this position, the vision of such an eye will be entirely destroyed. If the patient move the eye-ball freely and rapidly, the lens, or a greenish or amber-coloured body, will be seen to roll about in the eye. If the patient lean the head forward, the lens will rise into its proper place, or, perhaps, its upper margin may be seen, if the pupil is somewhat large, and he will be able to see in this position, not perfectly, but sufficiently well to find his way about, even in walking in a strange road, or in a place to which he has not been accustomed. Now it may happen that, in some of these cases, the lens may not be wholly detached, a slight connexion still existing at its lower margin, and then, of course, it will not float about so freely in the

vitreous humour, and will more readily come forwards if the head be inclined in such a direction ; in other instances, the lens and its capsule appear to be wholly detached from the hyaloid membrane, and, of course, when this takes place, the crystalline body will, in the erect position of the body, sink downwards, as an effect of its weight, and, by resting upon the retina, induce complete amaurosis.

I have seen many of these cases recently, and shall briefly refer to one or two of them, but, I must confess, I had never noticed this form of injury, until my worthy and enlightened friend, Mr. Smith, of Southam, obligingly sent to me a man, in whom the lens passed freely into either chamber of the eye, in accordance with the position of the head, sometimes coming in front of the iris and pressing that membrane, (which was in a state of vaccillation) towards the retina, and on leaning the head backwards, it would pass the pupil and resume its proper position, so that, I apprehend, in this instance, the hyaloid membrane was entire. It may be desirable to state that the lens preserved its transparency.

I have lately seen a person (Thomas Bennett) from Redditch, with my friend Mr. Bartleet, who has lost the sight of the left eye from former disease ; and that of the right is almost destroyed by the displacement of the lens, and its lodgment upon the retina. When walking about, he is obliged to lean the head forward, and to be constantly looking towards the ground ; for in this position only will the lens be raised from the retina. He is quite blind when the head is inclined backwards. The nature of the injury is sufficiently clear ; and perfectly cor-

responds with the history I have already given of this form of accident.

Whilst writing this report, I have seen a person (Thomas Blackham,) under the care of Mr. Jackson, of Westbromwich, who is suffering from a similar state of disease. He tells me that he received a blow upon the left eye, and that he soon afterwards lost the sight of that eye, although no very acute inflammation followed the infliction of the injury. The pupil is much enlarged and nearly immoveable; the iris is vacillating, and, at the bottom of the globe, the lens may be seen floating, in accordance with the movements and position of the head. As the details of this case are very similar to those of the last, I need not relate them. It remains for me only to refer to the subject of treatment.

It is evident that the lens cannot be broken up or destroyed, by any measures short of extraction; and, although I have successfully performed this operation in two cases of this description, I apprehend it is only desirable to perform it where the sight of the opposite organ is seriously impaired, or the organ itself is suffering a great degree of irritation from the agitation of the lens, or much interruption to vision from its movements.

In the instances to which I have referred, I have operated in the following manner. The patient being seated in a chair, with the head a little inclined forward, I make a free incision at the lower part of the cornea, with the triangular extraction knife, and having introduced a small hook beneath the flap, I succeeded in drawing the lens through the opening; in one case, after consider-

able delay, in the other, without the slightest difficulty. The difficulty in removing the lens, arose from its great mobility, and the impossibility of fixing the hook in the central and more solid part of its substance.

Hydrophthalmia.

(e) In my last report, which the Council did me the honour to publish in the first volume of the Transactions, I related the case of Sarah Millar, who was the subject of hydrophthalmia, for which I performed an operation not usually recommended for the cure of this tormenting malady. I there made mention of the size of the eye-ball, its painful condition of tension, and the irritable state of the opposite organ, and I particularly referred to the successful result of tapping as a means of cure, or as a mode of procuring much relief. It will be found that the operation I advised, was the removal of a small portion of the centre of the cornea, about equal to the plane surface of a split pea; and I mentioned, as the advantages of this method, that it was less painful than a more extensive removal of parts; that it excited less risk of producing suppuration, and a total collapse of the eye-ball; and infinitely less hazard of provoking that dreadful degree of ophthalmia which sometimes takes place, where,—when an eye-ball is excessively enlarged, and in that acutely inflamed state which usually attends such enlargement, accompanied by the irritable condition of health produced by this increasing agony,—a large portion of its anterior part is excised. The sequel of Millar's

case fully corroborates the accuracy of the view I was induced to form of the treatment of the disease from which she was suffering; and I am happy to state, that although the following extract from my first account of her case, proves that I had no desire to over-rate, nor express myself with an undue degree of certainty respecting the influence of treatment, yet the result of the operation has been perfectly satisfactory. In the report to which I refer, I thus expressed my apprehensions of the result:—"After the cornea had become adherent to the matter deposited from its cut edges, the pain returned in a slight degree; and I am afraid it will be necessary to repeat the operation, before the disease is quite cured."—(p. 347.)

My friend, Dr. Huey, has seen Sarah Millar, this day, at my request; and he is satisfied that the diseased is scarcely at all larger than the healthy eye; that it is very little disfigured (a small opacity in the centre of the cornea alone remaining); and that she is altogether relieved from her painful disease.

On the occasional effects of tumours in the eye-lids.

(f) Tumours in the eye-lids, and especially when near the tarsal margin, or situated between the tarsal cartilage and the palpebral conjunctiva, or when arising from the latter part, or growing from the precise edge of the eye-lid, will sometimes give rise to acute or chronic ophthalmia, and also excite amaurotic symptoms. And I have known all these effects result from the presence of tumours which did not appear to be sufficiently near the tarsal bor-

der to exert such an influence. I frequently remove tumours from the eye-lids for the cure of acute or chronic ophthalmia, which had resisted every variety of treatment previously employed for their relief; and with the effect of dissipating the inflammation in an amazingly short time.

A child was sent to me, a few days ago, with acute ophthalmia, which, to copy the words of its medical attendant, had refused to yield to every method of treatment he could suggest; it was also mentioned, that a little tumour existed in the eye-lid; but as it was very small, at some distance from the tarsal margin, and inadequate, as was presumed, both from its size and situation, to give rise to any irregularity of the mucous surface, it was considered to have no influence in maintaining the inflamed state of the eye. On carefully examining this child's eye, I found it to be acutely inflamed; and I discovered, also, a minute tumour situate between the tarsal cartilage and the conjunctiva lining the eye-lid; and although I perceived the propriety of removing this tumour, yet, as the eye was a good deal inflamed, I certainly did not consider this to be a favourable time for its extirpation; I therefore recommended various measures which usually relieve conjunctivitis, but without any beneficial result; and I then removed the tumour, at the child's second visit, and with the effect of curing the ophthalmia in a few days, without the use of any lotions or medicines of any kind.

A gentleman had a small granular excrescence at the margin of the upper tarsus, with great dimness of vision of the eye of the same side. I removed

this warty growth with a fine ligature; and which eventually removed the amaurosis also, an effect by no means expected or contemplated by the patient.

Miss A. of Birmingham Heath, had a small fungoid growth at the edge of the left interior tarsus, with various impairment of vision of the left eye. This growth was almost entirely removed by the application of the sulphate of copper; and her sight was completely restored. However, I ought to mention, that she took, at my recommendation, the carbonate of iron during the time she was in attendance at my house, for the purpose of having the sulphate of copper applied to the tumour.

I trust I shall not be considered tedious in thus referring to a cause of ophthalmia and amaurosis, which, though admitted to be such, is apt to be overlooked, from its presumed infrequency.

A REPORT OF THE OUT-CASES

ATTENDED

BY MR. PARSONS,

AT THE

BIRMINGHAM INFIRMARY,

FROM JANUARY 1, TO DECEMBER 31, 1833.

	Qr, ending March 31.		Qr. ending June 30.		Qr. ending Sept. 30.		Qr. ending Dec. 31.		TOTAL.	
	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.
Abortus, ...	2	...	...	...	3	...	3	...	8	...
Abscessus, ...	19	...	17	...	28	...	23	...	87	...
Abscessus, psoatic,	2	...	...	...	1	...	...	...	3	...
Amenorrhœa, ...	4	...	11	...	6	...	8	...	29	...
Anasarca, ...	3	...	1	1	1	...	4	2	9	3
Aphthæ, ...	2	...	2	...	8	...	5	...	17	...
Apoplexia, ...	3	1	4	1	1	1	3	2	11	5
Ascites, ...	1	...	1	1	2	1	1	...	5	2
Asthenia, ...	33	...	42	...	33	...	27	...	135	...
Bronchitis acut. ...	5	2	3	...	...	...	3	2	11	4
Bronchitis chron....	90	3	55	6	24	2	64	3	233	14
Carcinoma, ...	...	...	...	...	1	1	...	...	1	1
Catarrhus, ...	73	...	45	...	61	...	88	...	267	...
Catarrhus epidem...	...	...	643	12	...	...	...	...	643	12
Cephalœa, ...	13	...	13	...	15	...	15	...	56	...
Cholera biliosa, ...	...	...	2	...	26	...	5	...	33	...
Chorea St. Viti, ...	...	...	...	...	1	...	2	...	3	...
Colica pictonum,...	...	...	1	...	...	...	1	...	2	...
Constipatio, ...	18	...	19	...	30	...	17	...	84	...
Convulsiones (inf.)	8	3	3	...	5	3	3	1	19	7
Cynanche tonsill....	17	1	10	...	23	...	11	...	61	1
Delirium tremens,..	...	...	...	...	1	...	1	...	2	...
Dentitio, ...	7	...	13	1	3	...	8	1	31	2
Diarrhœa, ...	29	...	25	...	58	...	50	...	162	...
Dislocatio.	...	...	1	...	...	...	...	...	1	...
Dysenteria, ...	...	...	1	1	...	...	...	...	1	1
Dyspepsia, ...	51	...	54	...	52	...	51	...	208	...
Dysuria, ...	5	...	2	...	2	...	1	...	10	...
Epilepsia, ...	8	1	7	...	3	...	5	...	23	1
Erysipelas, ...	3	...	10	...	12	1	7	...	32	1
Erythema margin...	...	...	...	...	...	...	3	1	3	1
Erythema nodos....	3	...	3	...	7	...	1	...	14	...
Febris remit. inft.	9	...	18	1	2	...	2	...	31	1
Fistula in ano, ...	...	...	...	...	...	...	1	...	1	...
Fistula in perineo,	...	...	1	...	...	...	...	...	1	...
Fracturæ, ...	5	...	7	...	3	...	3	...	18	...
Gangræna, ...	...	...	...	...	1	1	1	1	2	2
Gonorrhœa, ...	44	...	37	...	46	...	40	...	167	...
Hœmoptöe, ...	5	...	3	...	5	...	2	...	15	...
Hæmorrhoides, ...	8	...	4	...	2	...	5	...	19	...
Hernia, ...	4	...	4	...	4	1	1	...	13	1
Hernia humoral....	6	...	1	...	2	...	1	...	10	...

	Qr. ending March 31.		Qr. ending June 30.		Qr. ending Sept. 30.		Qr. ending Dec. 31.		TOTAL.	
	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.
Herpes zoster, ...	4	...	2	...	1	...	1	...	8	...
Hydrocephalus ac.	...	...	...	...	1	1	1	1	2	2
Hysteria, ...	6	...	...	...	4	...	5	...	15	...
Icterus, ...	2	...	3	...	...	...	1	...	6	...
Incontinentia urin.	...	...	...	...	...	...	1	...	1	...
Laryngitis acut. ...	...	...	1	...	...	...	...	...	1	...
Leucorrhœa, ...	3	...	5	...	2	...	...	...	10	...
Lumbago, ...	12	...	10	...	6	...	6	...	34	...
Mania, ...	4	1	7	...	2	...	...	...	13	1
Marasmus, ...	7	3	10	3	8	3	7	2	32	11
Menorrhœa, ...	3	...	5	...	7	...	3	...	18	...
Neuralgia, ...	1	...	...	...	4	...	2	...	7	...
Œdema, ...	...	...	...	...	1	...	1	...	2	...
Ophthalmia, ...	13	...	6	...	5	...	5	...	29	...
Paralysis, ...	2	...	3	...	1	...	4	...	10	...
Peritonitis, acut....	1	...	...	...	...	...	1	1	2	1
Peritonitis, puerp.	...	..	2	2	1	1	...	...	3	3
Pertussis, ...	27	1	23	...	11	...	34	5	95	6
Phlegmasia dolens.	...	...	...	...	...	...	1	...	1	...
Phlogosis, ...	22	...	20	...	38	...	29	...	109	...
Phthisis pulmon....	15	10	8	6	8	6	12	9	43	31
Pleuralgia, ...	11	...	19	...	12	...	5	...	47	...
Pleuritis, ...	5	...	6	...	1	...	5	...	17	...
Pneumonia, ...	12	3	27	10	5	...	6	2	50	15
Podagra, ...	2	...	2	...	...	...	...	...	4	...
Porrigo, ...	22	...	12	...	10	...	19	...	63	...
Prolapsus ani, ...	...	...	1	...	...	...	1	...	2	...
Prolapsus uteri, ...	1	...	...	...	6	...	2	...	9	...
Psora, ...	21	...	6	...	15	...	15	...	57	...
Psoriasis, Prurigo, & other diseases of the skin	9	...	7	...	8	...	7	...	31	...
Ptyalismus, ...	2	...	1	...	...	...	...	...	3	...
Retentio urinæ, ...	...	...	1	...	1	...	...	...	2	...
Rheumatismus ac.	17	...	7	...	9	...	12	...	45	...
Rheumatismus ch.	13	...	8	...	7	...	12	...	40	...
Rubeola, ...	3	...	1	...	...	...	...	...	4	...
Scarlatina, ...	22	...	5	1	22	1	26	1	75	3
Schirrus, ...	1	...	...	...	...	...	...	...	1	...
Sciatica, ...	2	...	2	...	5	...	3	...	12	...
Scrofula, ...	4	...	9	1	4	...	5	...	22	1
Strictura recti, ...	...	...	...	...	...	...	1	...	1	...
Strictura urethræ,	1	...	...	...	1	...	...	...	2	...
Synochus, ...	63	2	31	2	58	3	54	5	206	12
Syphilis, ...	12	...	15	...	14	...	24	...	65	...
Ulcera, ...	32	...	32	...	31	...	17	...	112	...
Urticaria, ...	1	...	...	...	...	...	1	...	2	...
Variola, ...	21	5	8	1	11	2	44	11	84	19
Variola, post vac.	3	...	3	...	1	...	4	...	11	...
Vermes intestinal.	20	...	13	...	11	...	11	...	55	...
Various cases, including Burns, Wounds, &c.	40	...	51	1	44	...	36	...	172	1
Total, ...	942	36	1436	51	848	28	890	50	4116	165

In order that statistical papers may be of any value to those whose enquiries lead them to examine such records, it is desirable that the tables containing the information given, should be drawn out sufficiently in detail to exhibit, as readily and as copiously as possible, the various relations which the several facts and circumstances bear to each other. Viewing the subject in this light, I have been induced to deviate, in some degree, from the plan which I adopted in my report for 1832, published in the first volume of these Transactions. I have, in consequence, in the present report of my infirmary practice for the year 1833, detailed somewhat more fully the tabular statements of the cases of disease, and their proportionate mortality, according as the cases occurred in childhood or afterwards, and in the one or the other sex. The preceding general table shews the whole number of cases for the year 1833, to have been 4116; and the deaths, 165. In the two following tables, I have given the number of cases which came under my care, in each of the twelve months; distinguishing the cases as they occurred, in either sex, before the age of ten years, and after that age. It may, perhaps, be necessary to add, that the columns headed "died," do not contain the number of cases which died in each of the months, but the number of those cases which, occurring in the month, had a fatal termination. For instance, in January there were 320 cases of disease, and of these, 18 terminated fatally; but they did not all so terminate in January, some of them dying in February, and even in the succeeding months. A table, differently constructed from those now

given, and exhibiting the actual mortality in each month, would certainly, if combined with other information, tend to illustrate the subject of the salubrity or insalubrity of different periods of the year; but it must be very evident that such a statement would be quite irrelevant to, and could not in any degree illustrate the object of, this report. The 4116 cases occurred in the following proportions, in the several months.

	MALES.				FEMALES.			
	Under 10 *years.*		*Above that age.*		*Under* 10 *years.*		*Above that age.*	
	CASES.	DIED.	CASES.	DIED.	CASES.	DIED.	CASES.	DIED.
January,.....	42	5	99	3	34	3	145	7
February, ...	39	1	95	1	37	1	157	1
March, ...	43	3	84	4	47	4	120	3
April, ...	63	3	121	3	74	7	247	5
May, ...	83	5	184	4	55	7	358	6
June, ...	28	2	53	3	28	3	142	3
July, ...	26	2	85	1	28	1	159	6
August, ...	25	2	77	1	44	0	155	3
September,...	27	4	61	2	39	3	122	3
October,.....	70	6	98	1	43	6	141	3
November,...	46	4	60	4	31	5	132	4
December,...	41	2	67	2	38	5	123	8
	533	39	1084	29	498	45	2001	52

	TOT. MALES.		TOT. FEMALES.		OF BOTH SEXES.	
	CASES.	DIED.	CASES.	DIED.	CASES.	DIED.
January, ...	141	8	179	10	320	18
February, ...	134	2	194	2	328	4
March, ...	127	7	167	7	294	14
April, ...	184	6	321	12	505	18
May, ...	267	9	413	13	680	22
June, ...	81	5	170	6	251	11
July, ...	111	3	187	7	298	10
August, ...	102	3	199	3	301	6
September, ...	88	6	161	6	249	12
October, ...	168	7	184	9	352	16
November, ...	106	8	163	9	269	17
December, ...	108	4	161	13	269	17
	1617	68	2499	97	4116	165

In the following table I have arranged the whole number of cases, without reference to the period of

the year, but according as they occurred before the age of 10 years or afterwards, and in one or the other sex; noticing also the proportionate mortality in each instance.

	Under 10 years.	*Died.*	*Proportionate Mortality.*
Males, ...	533	39	1 in 13,66
Females, ...	498	45	1 in 11,07
	1031	84	1 in 12,27

	Above that age.	*Died.*	
Males, ...	1084	29	1 in 37,38
Females, ...	2001	52	1 in 38,48
	3085	81	1 in 38,09

	Males.	*Died.*	
Under 10 years,	533	39	1 in 13,66
Above that age,	1084	29	1 in 37,38
	1617	68	1 in 23,78

	Females.	*Died.*	
Under 10 years,	498	45	1 in 11,07
Above that age,	2001	52	1 in 38,48
	2499	97	1 in 25,76

	Total.	*Died.*	
Males, ...	1617	68	1 in 23,78
Females, ...	2499	97	1 in 25,76
	4116	165	1 in 24,95

The remaining short tables shew the distribution of cases of some of the principal diseases, both according to the age and sex, and the period of the year in which they occurred.

MANIA.

	Males.	*Females.*	*Died.*
1st Quarter, ...	2	2	1
2nd Quarter, ...	4	3	0
3rd Quarter, ...	0	2	0
	6	7	1

The fatal case occurred in a woman, between 60 and 70 years of age. She refused to take any food, and her friends would not allow the introduction of nutriment into the stomach to be effected by means of the stomach-pump. I first saw the patient on the 16th of March; and she died on the 21st. The cases of mania, 13 in number, were all adults: their proportion to the whole number of cases of disease, is as 1 to 316,6.

EPIDEMIC CATARRH.

	MALES.				FEMALES.			
	Under 10 years.		*Above that age.*		*Under 10 years.*		*Above that age.*	
April, ...	17	0 died.	35	1 died.	24	1 died.	75	0 died.
May, ...	43	1 died.	116	1 died.	32	4 died.	273	3 died.
June, ...	3	0 died.	6	0 died.	3	0 died.	16	1 died.
	63	1 died.	157	2 died.	59	5 died.	364	4 died.

Males, ...	220	3 died.
Females, ...	423	9 died.
	643	12 died.

The epidemic catarrh of 1833, in its specific characters, closely resembled that of 1831; but it differed from the latter very widely, by attacking a much larger number of individuals; by assuming a more severe and dangerous type; and by the greater mortality which attended it. Its symptoms and treatment have been so frequently noticed lately, that I shall not advert to them in the following brief remarks on this disease. Of the 643 cases given in the report, 12 had a fatal termination, as a direct consequence of the attack; but a much larger number of deaths could be clearly traced to the injurious effects, on the general health, which the influenza, in many instances, produced, especially in the cases

of the very young and aged, and of those who had any disease, or predisposition to disease, in the organs of respiration. The first of the cases in the report, was met with as early as the 11th of April; but it was not till about the 25th or 26th of that month, that the disease assumed clearly the epidemic character: after that time, however, it spread with extraordinary rapidity through this town; and did not very materially decline till the middle of May. I saw no new case after the 13th of June.

I met with several instances of relapse. In two cases, it occasioned abortion at the third month of pregnancy; and in two others, it caused premature labour to commence about the seventh month. In one case it was attended with severe hæmorrhage from the lungs, but the patient ultimately recovered; and in another patient, a young girl about 12 years of age, the disease, a few days after its commencement, became complicated with a bad attack of erysipelas of one foot and leg, a large portion of the integuments of which sloughed; the patient recovering only after a long and very severe illness. I may add that six of the fatal cases were children under five years of age.

It would be difficult to obtain even an approximation to the actual mortality directly caused by this epidemic; but the following table, made from the burial registers of four only of the churches and chapels of this town, shew that it must have been large; for, during the month of May, when the epidemic had attained its maximum, but little other disease was met with.

Burials in	1832.	1833.
April, ...	205	245
May, ...	211	434
June, ...	193	230
	609	909

The 643 cases of Epidemic Catarrh are, to the whole number of cases, as	1 to 6,4
The deaths from Epidemic Catarrh are, to the 613 cases of that disease, as	1 to 53,58
The deaths from Epidemic Catarrh are, to the whole number of deaths, as	1 to 13,75
The deaths from Epidemic Catarrh are, to the whole number of cases of disease, as	1 to 343

CHRONIC BRONCHITIS.

	MALES.		FEMALES.	
1st Quarter, ...	39	1 died.	51	2 died.
2nd Quarter, ...	22	2 died.	33	4 died.
3rd Quarter, ...	14	1 died.	10	1 died.
4th Quarter, ...	18	0 died.	46	3 died.
	93	4 died.	140	10 died.

The 233 cases of Chronic Bronchitis are, to the whole number of cases of disease, as	1 to 17,67
The deaths, 14, are, to the 233 cases, as	1 to 16,64
..... to the whole number of deaths, as ...	1 to 11,79
..... to the whole number of cases of disease, as	1 to 294

PNEUMONIA.

	MALES.				FEMALES.			
	Under 10 *years.*		*Above that age.*		*Under* 10 *years.*		*Above that age.*	
1st Quarter, ...	6	1 died.	0	0 died.	6	2 died.	0	0 died.
2nd Quarter, ...	12	3 died.	0	0 died.	13	7 died.	2	0 died.
3rd Quarter, ...	2	0 died.	0	0 died.	3	0 died.	0	0 died.
4th Quarter, ...	2	1 died.	1	0 died.	2	1 died.	1	0 died.
	22	5 died.	1	0 died.	24	10 died.	3	0 died.

Fifty cases of this disease occurred, and fifteen of them terminated fatally. Twenty-five of these cases, ten of which died, were met with in the second quarter of the year, chiefly, indeed, in the months of April and May, but more particularly towards the end of the former; and the cause of this was very

evident at the time. Several, in fact the greater part, of the cases which came under my care, in April and May, were very young children, who had recently had an attack of the influenza, at that time, as already noticed, prevailing to so unexampled an extent throughout this town and neighbourhood: and so imperfectly had many of the children recovered from the previous attack of epidemic catarrh, that their cases might, perhaps, with almost equal propriety, have been placed under this latter disease.

The 50 cases of Pneumonia are, to the whole number of cases of disease, as	1	to	82,32
The deaths, 15, are, to the 50 cases, as	1	to	3,33
..... to the whole number of deaths, as ...	1	to	11
..... to the whole number of cases of disease, as	1	to	274,4

SYNOCHUS AND TYPHUS.

	MALES.				FEMALES.			
	Under 10 *years.*		*Above that age.*		*Under* 10 *years.*		*Above that age.*	
1st Quarter,.....	14	0 died.	20	1 died.	14	1 died.	15	0 died.
2nd Quarter, ...	11	2 died.	3	0 died.	10	0 died.	7	0 died.
3rd Quarter, ...	6	1 died.	18	0 died.	14	0 died.	20	2 died.
4th Quarter, ...	15	0 died.	16	2 died.	9	1 died.	14	2 died.
	46	3 died.	57	3 died.	47	2 died.	56	4 died.

Of the 206 cases, 12 died; 93 of the cases occurred in children under the age of 10 years, and of these 5 died; and 113 occurred after that age, of which 7 died.

The 206 cases of Fever are, to the whole number of cases of disease, as	1	to	20
The deaths, 12, are, to the 206 cases, as	1	to	17,17
..... to the whole number of deaths, as.....	1	to	13,75
..... to the whole number of cases of disease, as	1	to	343

SCARLATINA.

	MALES.				FEMALES.			
	Under 10 yrs.		Above that age.		Under 10 yrs.		Above that age	
1st Quarter,.....	9	0 died.	3	0 died.	8	0 died.	2	0 died.
2nd Quarter, ...	3	0 died.	0	0 died.	2	1 died.	0	0 died.
3rd Quarter, ...	6	0 died.	2	0 died.	7	1 died.	7	0 died.
4th Quarter, ...	4	0 died.	6	0 died.	7	1 died.	9	0 died.
	22	0 died.	11	0 died.	31	7 died.	18	0 died.

Forty-six of the cases of scarlatina occurred before the age of 10 years, and three of these terminated fatally.

The 75 cases of Scarlatina are, to the whole number of cases of disease, as ..... } 1 to 54,88
The deaths, 3, are, to the 75 cases, as, ... 1 to 25
.... to the whole number of deaths, as ..... 1 to 55
..... to the whole number of cases of disease, as 1 to 1372

VARIOLA.

	MALES.				FEMALES.			
	Under 10 yrs.		Above that age.		Under 10 yrs.		Above that age	
1st Quarter,.....	14	4 died.	0	0 died.	7	1 died.	0	0 died.
2nd Quarter, ...	3	0 died.	0	0 died.	5	1 died.	0	0 died.
3rd Quarter, ...	6	2 died.	0	0 died.	3	0 died.	2	0 died.
4th Quarter, ...	25	6 died.	0	0 died.	16	5 died.	3	0 died.
	48	12 died.	0	0 died.	16	5 died.	5	0 died.

Of the 84 cases, 9 died; 5 only occurred after the age of 10, and these all recovered.

The 84 cases of Small Pox are, to the whole number of cases of disease, as ..... } 1 to 49
The deaths, 19, are, to the 84 cases, as ..... 1 to 4,4
..... to the whole number of deaths, as..... 1 to 8,68
..... to the whole number of cases of disease, as 1 to 216,6

In addition, however, to the 84 cases just noticed, 11 cases of small-pox, occurring after vaccination,

came under my care at the infirmary, during the last year; and as the promised security from small-pox, by means of vaccination, is now often questioned, and that even by some medical men, I shall state, from such information as I could obtain, the period of time which, in each case, had elapsed between the date of vaccination and the occurrence of the small-pox; and shall add some short remarks respecting the appearance of the vaccine cicatrix, and the severity or mildness of the small-pox. The 11 cases are briefly as follows:

Feb. 13.—— Woolfe, a Swede, 22 years old, was vaccinated when a young child, but could not tell at what age. One vaccine cicatrix could be seen, but it was partly obscured by the eruption of the small-pox, which was very general over the whole body, and was attended for several days with much fever.

March 14.—Sarah Green, 32 years of age, was vaccinated when a child. One vaccine cicatrix was very distinct. The attack of small-pox severe.

March 23.—Elizabeth Biddlestone, 30 years of age, was vaccinated when a child. One cicatrix was still visible. The attack of small-pox was severe.

April 2.—Hannah Collins, 8 years of age, was vaccinated in her first year. Two cicatrices distinct and large. The attack of small-pox was slight.

April 10.—William Guest, 3 years old, was vaccinated in his first year. Two good vaccine cicatrices. The attack of small-pox was slight, but was preceded by considerable fever.

May 21.—Mary Anne Humphries, 13 years old, was vaccinated twelve years since. Two vaccine

cicatrices, both very distinct. The attack of small-pox was slight.

Sept. 19.—Sarah Green, 16 years of age, was vaccinated twelve years since. Two vaccine cicatrices faintly visible. The attack of small-pox was not severe.

Oct. 29.—Anne Jeffs, 7 years of age, was vaccinated three years since. Three good vaccine cicatrices. The attack of small-pox was slight.

Nov. 11.—Jane Thompson, 17 years of age, was vaccinated at the age of 7 months. Two vaccine cicatrices very distinct and good. The small-pox was not severe; but there was much fever before the eruption appeared.

Nov. 16.—Sarah Phillips, 18 years of age, was vaccinated sixteen years since. Two good vaccine cicatrices. The small-pox was not severe.

Dec. 13.—Francis Chatwin, 12 years of age, was vaccinated eleven years since. The vaccine cicatrices very distinct. The attack of small-pox was not severe. The parents of this boy would not have another child, about one year old, vaccinated, on account of the small-pox having attacked the elder boy after vaccination. The young child subsequently, (early in the present year,) had the small-pox very badly, and died.

These 11 cases are, to the 84 cases of ordinary Small Pox, as 1 to 7,6
.. .. to the whole number of cases of disease, as 1 to 374

CONSTIPATION.

	MALES.	FEMALES.
1st Quarter, ...	3	15
2nd Quarter, ...	2	17
3rd Quarter, ...	4	26
4th Quarter, ...	2	15
	11	73

DIARRHŒA.

	MALES.		FEMALES.	
	Under 10 yrs.	Above that age.	Under 10 yrs.	Above that age.
1st Quarter, ...	14	3	8	4
2nd Quarter, ...	11	3	6	5
3rd Quarter, ...	15	8	19	16
4th Quarter, ...	23	7	15	5
	63	21	48	30

The 162 cases of Diarrhœa are, to the whole number of cases of disease, as..... } 1 to 25

CHOLERA BILIOSA.

	MALES.	FEMALES.
2nd Quarter, ...	1	1
3rd Quarter, ...	7	19
4th Quarter, ...	1	4
	9	24

The 33 cases of Bilious Cholera are, to the whole number of cases of disease, as ..... } 1 to 124,7

DYSPEPSIA.

	MALES.	FEMALES.
1st Quarter, ...	17	34
2nd Quarter, ...	17	37
3rd Quarter, ...	15	37
4th Quarter, ...	6	45
	55	153

The 208 cases of Dyspepsia are, to the whole number of cases of disease, as..... } 1 to 19,8

Cynanche tonsillaris.—In the tabular report, one of these cases is marked as having terminated fatally. It occurred in a boy 8 years old ; and proved fatal by causing extensive sloughing in the fauces.

Hernia.—The circumstances attending the death of the patient who died of hernia (strangulated), are, perhaps, not undeserving of notice. The patient was a woman, 64 years of age, and the hernia was femoral, on the right side. She was, herself, desirous of having the operation performed, as soon as the necessity for it was pointed out to her; but for some time it was decidedly objected to by her family. Their assent, however, being given at a late hour at night, I was about to perform the operation, when several of her relations brought into her room a neighbour, for the purpose of praying near her, before any thing was done. They were cautioned, but in vain, both by one of my colleagues (Mr. Baynham), and by myself, as to the effect this might have on the mind of the patient, who, up to that time, had been calm and in good spirits. The prayer, as we had feared would be the case, proved to be of the worst possible character for the occasion; and it produced the most complete hopelessness and despondency in the mind of the poor patient. On removing her from the bed to the table, we found that her physical, as well as her mental, powers, had suddenly and completely sunk: she had no pulse, and her limbs lay as motionless as those of a dead body. We tried, but vainly, to rouse her by giving brandy, and speaking encouragingly to her. Mr. Baynham, and myself, felt satisfied that, in her present state of prostration, the additional shock of the operation would have destroyed her at once; she was, therefore, removed carefully to her bed, the hernia still remaining irreducible. She never rallied, and died a few hours afterwards.

The next day I opened the body, and found that the strangulated intestine was a portion of the ileon: it was not adherent to the sac, and was quite uninjured in its texture.

GEORGE PARSONS.

Birmingham, April 12, 1834.

PART VI.

Biography.

BIOGRAPHICAL MEMOIR OF THE LATE DR. JOHN DARWALL,

OF BIRMINGHAM.

BY JOHN CONOLLY, M. D.

OF WARWICK.

Since the publication of the preceding volume of the Transactions, the Association has been deprived, by a premature death, of a member whose contributions would, in all probability, frequently have added value to these pages; a physician whose learning, experience, and never-ceasing ardour for knowledge, alike fitted him for promoting some of the best designs contemplated at the foundation of this society. That the Transactions should preserve some record of a physician who had already risen to great estimation among his provincial brethren, and whose life was passed in professional labours, and, eventually, forfeited in their prosecution, is but a simple act of justice. That such a record should be made by myself, is but part of a sacred debt of friendship, due to the memory of one with whose virtues I had opportunities of becoming thoroughly acquainted; and whose death I shall not cease to lament as long as my own existence continues. I

know the difficulty of making such a record impartial; but I should most imperfectly discharge this last duty to one who was the most sincere and candid of men, if I were to state anything unfaithfully. Few men had fewer faults requiring palliation, and few more of those sterling merits to which a laboured eulogy could add nothing. If his spirit, freed from its earthly bonds, is conscious of what is done on earth, I well know that it would not be soothed by flattery, or approve of any syllable of praise offered at the expense of truth.

Dr. John Darwall was the son of the Rev. John Darwall, who was the incumbent of St. John's Chapel, at Deritend, and one of the masters of the Free Grammar School, in Birmingham, until his death in 1828. His mother, who lives to deplore the loss of such a son, was the sister of —— Whateley, Esq. of the same town. He was born in 1796, and, at the age of five, was sent to a preparatory school: when he was eight years of age, he was taken under his father's care in the Grammar-school; and, in 1808, he was placed under the immediate tuition of the Rev. John Cooke, then, as now, head master of the school. Of his habits and pursuits as a boy, I have been able to collect few particulars. He is said to have been fond of such exercises as required activity of mind, and to have taken more pleasure than boys usually do in his classical learning, and, consequently, to have excelled in it. The attachment that he ever retained for classical studies, the praise of which was not unfrequently mixed with the professional information with which, in after years, his letters abounded, was among the

best proofs that he had been a diligent scholar under able teachers. Far from adding to the innumerable examples of those who, boasting of a classical education, retain little love of ancient learning, and acquire as little of modern literature, he preserved, in all circumstances, a fondness for those liberal studies which have, in all ages, been acknowledged to adorn success, and mitigate the unavoidable trials of adversity. This circumstance was, probably, in part, attributable to an accidental direction given to his mind after his school-days, but must partly be ascribed to the exercises of the grammar-school, and partly to that parental care of which he ever cherished a grateful and pious remembrance.*

Next to the advantage of having a good schoolmaster, must be placed that of having an able professional instructor in early life; an advantage which was possessed, in an eminent degree, by the subject of this memoir. Soon after leaving school, in 1813, he became the pupil of the late Mr. George Freer, of Birmingham, one of the most distinguished provincial surgeons of his time, and a gentleman of a very amiable private character. From this period, the papers, note-books, and memoranda of Dr. Darwall, present remarkable evidences of the in-

* Upon the fly-leaf of his father's copy of the Inaugural Dissertation published by Dr. Darwall, in Edinburgh, in 1821, are the following lines in Dr. D.'s hand-writing. "This volume is presented to the Rev. John Darwall, as a small but sincere memorial of gratitude for parental solicitude, exerted towards the author through many years, with equal judgment and kindness. That as he has lived to see this first production, so that he may live to reap more mature and solid benefits from the author's exertions, is the sincere prayer of his affectionate son, John Darwall."

terest which he took in the profession in which he was now to be educated, and of the industry which even then characterised him. The earliest notes of cases witnessed by him, are dated in March, 1815, when he was but nineteen years of age. A few are surgical, but it would appear, both from his notes, and from the abstracts of works which he read, the habit of making which seems to have been acquired at this time, that the study of medical cases and writings soon proved more attractive to him. Whilst he appears to have been a very diligent medical pupil, he was by no means inattentive to general science and literature. There is a list of his own books, made, I believe, about this period, which shews that he endeavoured in all subjects to select the best; and his memoranda display many traces of his having been a most attentive and reflecting reader.

Even in this early part of his life, he was remarkable for a gravity of deportment, strongly contrasted with the vivacity of his intellect. He possessed few of the light accomplishments which render young persons acceptable in society; and he was heedless of any associates but such as could improve him by their greater knowledge and experience. Several years afterward (in 1824) when he was himself settled in practice, he tells me, in reply to an invitation to a ball, that he "never had been in a public ball-room in his life." He had participated, indeed, in none of the gaieties of youth; but in their place had courted meditation and wisdom, He had very early acquired the habit of proposing to himself some particular subject, on which he would occupy

his thoughts in his walks; and the faculty of concentrating his attention, thus strengthened, made him contemn frivolous diversions, and discontented with any thing short of full and exact knowledge, in any subject which came before him. The quickness and clearness of his apprehension led him readily to understand many subjects thoroughly, on which many, who live in society, are content to talk superficially, if they can talk agreeably; and his strict sense of what was due to truth, made him, perhaps, too prone to disputation, and too unceremonious in his manner of conducting it. These peculiarities, which were the basis of the reputation which he lived to acquire, never quite deserted him in after life; but as his knowledge increased, and his acquaintance with mankind became larger, he was observed to become less dogmatical in the assertion of his opinions, and more indulgent to those whom he knew to be wrong, and with whom he happened to dispute. But it must be confessed, that he never became tolerant of ignorant presumption; and that he was never disposed, either from courtesy to age, or respect to station, or from indifference, to allow what was true to be sacrificed to what was merely specious. As he grew older, too, and became more known, and, I may add, distinguished, he found fewer who disputed with him. Some feared his more exact knowledge, and others too deeply respected him to be guilty of much conversational provocation. Yet, with these changes, which he could not but observe, he did not become more, but less arbitrary; and, although few people ever adhere so strongly as he did to opinions formed very early in

life, it was generally observed of him that he had grown more and more considerate in the expression of opinions which no one suspected him of being likely to abandon.

The unusual steadiness of his outward deportment, which sometimes raised a pardonable smile in those who thought merely of his youthful years, was but the outward sign of his composed and thoughtful mind, and of a temperament so little prone to any irregularities, that he seemed an exception to all the instances of youthful folly, and quite incapable of any approach to what was vicious. Yet this happy exemption from faults that are so often commingled with fine and promising qualities, and which, too, they often mar and always enfeeble, was conjoined with a singular candour in estimating the conduct of men less happily organised, or less habitually exercising a severe self-command. This, also, was a characteristic developed early, and which always continued to distinguish him. Together with this singular purity of morals, was associated a generosity of disposition often wanting to such natures. For any becoming object—for the acquisition of the means of knowledge—for the maintenance of a proper station, he thought no sacrifices too considerable; but he had nothing to spare for luxury, or vanity, or sensuality, or any kind of selfish indulgence.

In October, 1816, he went to London to attend the hospitals and lectures. It was now his good fortune to be a daily hearer of the eloquent and instructive lectures of Mr. Abernethy, of some of which he took, and carefully preserved, copious notes. He became much attached to that great

man, whose merits he knew how to appreciate amidst the eccentricity by which they were surrounded. In May, 1817, he became a member of the College of Surgeons, and, not content with the superficial manner in which medicine was, at that time, taught in London, went to Edinburgh, in the autumn of the same year, to study physic under the celebrated masters who then lectured in the college of that city.

There is many a reader of this tribute to Dr. Darwall's memory, to whom the allusion to the pleasure a youth, so disposed, would experience on first going to Edinburgh, will recall emotions of a very agreeable kind. To a young medical student, anxious to become accomplished in his profession, and expecting its highest honours as the reward of some years of delightful study, the approach to Edinburgh, where, not to mention other honoured names, Gregory then taught in the chair of physic, Monro and Barclay lectured on anatomy, and Gordon on physiology, was an æra never, amidst future cares and changes, to be forgotten. Nor did experience reflect any shade of disappointment on such feelings. The admirable lectures, to the hearing of which the college bell daily awoke the student, who arose from no distempered couch by dissipation fevered; the excellent instruction to be daily gained in the clinical wards of the infirmary; the studious zeal which seemed to pervade the whole University; the animating discussions carried on in the medical society, where were laid the foundations of blessed friendships; these are things which must ever form the most cherished portion of an Edinburgh student's

recollections. There are few who, looking back on those studious, temperate, happy years, can say that time has brought them any thing more valuable; nay, there are doubtless many who, amidst the vexations, the animosities, the distractions, and the struggles that have since befallen or engaged them, have often wished that their lives could have been passed in that academic seclusion to which few worldly feelings found their way, and in which science could be tranquilly pursued.

No student ever went to Edinburgh with a higher ambition, or with a firmer determination to waste no time whilst there, than Dr. Darwall. He had some letters of introduction to celebrated individuals, but, like most Edinburgh students who become interested in the business of the place, I believe he gradually left off all society, except that of his fellow students, and those of his teachers whom he had the advantage of being acquainted with. I have often heard him speak, in terms of admiration, of Dr. Gordon; and he deeply participated in the regret which all lovers of the profession felt at the death of that distinguished lecturer, whose talents, had he lived, could not but have reflected a new lustre on the great school of Edinburgh.

How his days would be spent in Edinburgh, no one, who has studied there, can require to be informed. Every hour brought its regular occupation, and every hour added something to his note-books. Full notes of the comprehensive lectures of Dr. Home, on the materia medica, are among his papers; and notes of cases, medical and surgical, seen, or read of, or heard of; with extracts from, and ab-

stracts of, medical books and works of general literature, which he found time to peruse in the evening. His reading, at this period, was very extensive. Large libraries were open to his eager curiosity, and he read on without regard to his health, laying, thus early, the foundation of inveterate dyspepsia, by which his frame became, at length, so much affected, as never quite to recover a state of perfect health. Should these pages be perused by some one who, like him at the time I speak of, is depriving himself of needful exercise and rest, with the exalted hope of mental distinction, let him think of the *example* held forth in this memoir, (for what student ever was moved by the *precept* itself,) and learn, that to sacrifice some time to repose, and some to relaxation, is really to *gain* time; and that to hope to get the start of mankind, by neglecting the suggestions of worn and irritated nerves, is a deceitful hope, which, with alluring sounds, has drawn aside a thousand aspiring spirits to destruction.

After a winter thus passed, Dr. Darwall returned, for a time, to Birmingham, and I can gather from his note-books, that he returned an enthusiastic and devoted student. The activity of his mind seems to have been exercised on a variety of subjects. His knowledge was increased, and his industry was not diminished. His notes of cases are continued. Several observations seem, about this time, to have been made by him on the diseases of work-people; and it is probable that, before he returned to Edinburgh, in the autumn of 1819, he had collected most of the materials for a paper on that subject, which

he read, in 1820, to the Medical Society, as well as for his Thesis *De Morbis Artificum*. It is to be remarked, that he seldom wholly abandoned any subject to which his attention had once been particularly directed. With the help of his private papers, and of his published works, we may trace this subject from his first detached observations, made when visiting different manufactories, to his essay before the Medical Society, in 1820, then to his Thesis, in 1821; from thence to his papers in the Medical Repository, in 1825; and, lastly, to the well-considered article on the Diseases of Artisans, which he contributed to the 1st volume of the Cyclopædia of Practical Medicine, in the last year of his life. Whilst no subject connected with health and disease seems to have escaped his attention, he was not unobservant of the wonders of machinery by which he was often surrounded in the scene of his observations, and on these and on different manufactures, he was in the habit of making occasional memoranda.

On Dr. Darwall's return from Edinburgh, in 1818, after passing one winter there, he became the assistant of Mr. Freer, whose health was declining; and, up to this time, it seems to have been the wish of his friends that he should practice surgery in Birmingham. His Edinburgh studies had suggested a different course to him, and other circumstances favouring his design, he returned, in the following year, (1819) to Edinburgh, with a determination to study for a doctor's degree. It is easy for those who knew him, to imagine that this intervening year, passed in surgical practice, was borne somewhat impatiently by one so capable of further enjoying

the advantages with which, as an Edinburgh student, he had already become acquainted. But, whatever might be his wish to become once more a student, it did not abate his industry, or lead him to waste the passing hours.

Like all young men of studious habits, he commenced many essays, on many subjects; but his essays, unlike those of most young men, contain great proofs of reflection and judgment. To one note book, apparently commenced at Birmingham, in 1818, is prefixed a motto from Harvey's Conclave of Physicians; "That which is the soul of a physician, and animates those previous dispositions, (for theory is no other,) is sagacity and observation." No sentence could better have characterised him who copied it, and followed the advice which it conveys. He began essays on vaccination, on contagion, on the functions of arteries, and on neuralgia; the last in Latin. For the press he composed slowly, with little care for words, but great anxiety for the matter; and he was never satisfied until he had referred, on any subject which occupied him at the time, to every author of repute whose works were within his reach, although he surrendered his deliberate judgment to none. It seems to me that it would be an officious and spurious act of friendship to publish what he evidently thought too unfinished for publication; but even these fragments are worthy of him. Among the notes of his general reading, one, suggested by the perusal of the Life of Bishop Watson, forcibly attracted my attention. It related to the early part of the bishop's life, and was curiously illustrative of his own ambition, his difficulties, and his success; so

that I could not but fancy it probable that he was led to make such a note by an almost unconscious sympathy with the destiny to which it pointed.

Although he still continued very regardless of general society, he certainly felt occasional mortification from the consciousness of having too much neglected the art of conciliating many, who, he began to find out, were insensible or indifferent to all which he more justly prized in himself; and from which he had, perhaps, expected that their favour would alone be gained. I have heard him, in after years, refer to these feelings, and lament his inability to win people's kindness more generally; and once or twice have known him quote, in a tone of melancholy bitterness, the words expressive of the dismal fate of those who

> "——— roam along, the world's tired denizens,
> "With none who bless them, none whom they can bless."

The winter of 1819-20, saw him return to Edinburgh, full of new health and spirits, to commence his second winter's studies; and from this period, until the day of his death, it was my happiness to be intimately acquainted with him. My first remembrance of him, is at the Friday night discussions of the Edinburgh Medical Society; in which he often took an active part. And, certainly, when I noted his pale, restless, sad, and penetrating countenance, and his somewhat ungraceful figure, and heard the brief and cutting apothegms, or severe or sarcastic mode of public address, in which he then delighted, whatever respect I felt for his talents and knowledge, I was little inclined to intimate friendship with him. Farther and various opportunities taught me all his

value, although at a later period than that of which I am now speaking.

Dr. Darwall's personal appearance, at this time, was nearly such as he preserved throughout his short life. He was of a middle stature, and strongly made, but without clumsiness or corpulency. His quick walk, and general rapidity of movements, were very indicative of the decision of his character. His face was pale, his eyes were grey, and rather small; his hair was light brown, and straight; the general expression of his countenance was not lively, but when he spoke, there was that both in his expression and his manner, which never failed to impress on those who felt little interest in him before, the idea that he was a man of a very superior understanding. In private society, with young persons, and with ladies, he was animated and even playful; but the more accomplished the company in which he was, the more did his own talents manifest themselves. He was always scrupulously attentive to his dress. He was fond of seeing men eminent for any attainment, and to strangers, as well as to his friends, as he grew older, he was invariably courteous in his reception, most hospitable in his entertainment, and very agreeable in his conversation.

During the winter of 1819-20, already mentioned, we met, as many other students only met, in the morning at the lectures or the hospital, and once a week at the society. The other evenings of each week were spent by most of us in secluded study, consequent on the occupation of the past day, or preparatory for the morrow. Our relaxation was the Society, to which I now look back with mingled

feelings of pleasure and of sorrow ; for, of those who enlivened or adorned it many are since dead, and not a few, like my lamented friend, in the midst of the most active years of life.

The session of that winter was one which few, who were then in the habit of attending the Medical Society, can have forgotten. Very early in it, a discussion occurred concerning the merits of a paper, written by a surgeon now of great eminence in Edinburgh, but who was considered to have shewn, by the shortness of this contribution to the society, and certain marks of deficient care which it bore, a want of that respect to which an assembly of students was somewhat morbidly sensible. This discussion first brought before the society another friend, whose death I have, within the last few months, to lament, the late Dr. Henry Gaulter, of Manchester, whose great eloquence was only second to his great acquirements and virtues. But the society was, that winter, still more deeply agitated, by the publication of a mock-heroic poem, in which some liberties were taken with its most prominent members. In the warm debates which ensued on the question of expelling the poet, and which were several times adjourned, the society exhibited a picture of the larger world of strife, but without the breaking up of friendships among those who then contended for one side or the other, with an earnestness on which they doubtless often look back with some degree of amusement. These questions being considered of no small importance, had the effect of exciting the members, during the whole of that session, to unusual exertions : every thing was done with spirit

and energy, and, at some of the discussions, even on medical subjects, the Hall of the society, and the very staircase, were crowded with visiters, attracted by the interest of the questions, or the reputation of those who were to conduct the debate. Of the four presidents elected after that busy session, two, Dr. Gaulter and Dr. Lane, have since died, before age had overtaken them: the latter died before the year of his presidency expired, and Dr Brabant, now of Devizes, was almost unanimously elected in his room. Dr. Burne, now of London, and myself, were the other two. This office, it is well known, is one eagerly desired by Edinburgh students, being almost the only honour or mark of distinction which is open to them in that University. Like other offices, it is said to have been, sometimes, "derived corruptly:" but, in the session of which I am speaking, by whatever degrees of merit it might be gained by the different candidates, I feel fully assured it was not obtained, in any instance, by any superfluous expenditure of money. That Dr. Darwall desired to fill this office, and that he ought to have filled it, was never doubted by those who knew him; but he distrusted his popularity, and was absent at the time of the annual election. He was, however, always looked upon as one of the members who conferred most honour on the society, by his learning and talents, and he took a very active share both in the discussions and in the management of the institution. Although he evidently carefully prepared himself on the subjects to be discussed, it was not in his nature to be solicitous about the mode in which his opinions were expressed. His language

was scrupulously correct, and his manner was earnest; but he seldom condescended to enliven his remarks by those graceful digressions, without which the good will even of scientific auditors cannot always be conciliated. In public debate, or in private conversation, Dr. Darwall's extreme correctness of information rendered him, as I have observed it did in earlier years, formidable to superficial persons, who generally constitute a majority of an auditory; and those who could not disprove his facts, were, sometimes, glad to find consolation in the complaints they could make, with some kind of justice, of the unpalatable way in which their information had been amended.

The Medical Society, however, of which I have thus spoken, with, I hope, not an unpardonable garrulousness, was still but a place of relaxation to Dr. Darwall; and he did not always willingly give up an evening to its business. He felt that the days of a student's life are few and precious; and that those who neglect them, will long repent that they forgot such days would not last for ever. I imagine that he was seldom or never guilty of throwing away an hour.

As I took my degree on the same day with him, in August, 1821, I happened, during the early part of that year, to see more of him than I had done before. He had become a husband, having, some months before, married the only daughter of Philemon Price, Esq. of Birmingham, a lady in every way worthy of his choice, and who now survives him. During part of the winter, Mrs. Darwall was with him in Edinburgh, but when the anxious period

of the examinations approached, he was again living alone for a few months, Mrs. Darwall being in England; and his domestic habits having rendered the solitude of his evenings irksome to him, I and my family had, very frequently, the pleasure and advantage of his society. With the ambition of a student might now be perceived the ambition of one conscious of his own power, and eager to enter the lists with those who were candidates for actual practice, in the large town of which he was a native, and which he never ceased to consider his fixed home. He passed his examinations with the highest credit, and, even, honour; but was so impatient of the mere ceremonials of the graduation, and so anxious to feel himself settled, that all the persuasions of his fellow-students could not dissuade him from leaving Edinburgh on the very day on which he attained the doctorate. And if he left the place of his studies with too sanguine an expectation of a long life of success, he at least so continued, and even increased his industrious labours during the twelve years more of life allotted to him, as to have left nothing undone to deserve it.

My own intercourse with him seemed, at that time, to have terminated, in all probability, for ever; but various accidental circumstances, such as so often influence our most important determinations, very unexpectedly caused me, within two years from that time, to settle at Stratford, little more than twenty miles from Birmingham; and gave occasion to a renewal of that friendly intimacy which never ceased until his lamented death.

In May, 1823, I paid my first visit to him in Birmingham, and found him as laborious, and as full of ambition, as when a student. He had much increased his stock of books, but had exchanged the habit of sitting up late to read them, for the better custom of rising very early, which practice he long persevered in. He had been elected physician to the General Dispensary, and devoted a large portion of his time to its duties. In one of his books I find the names of more than three thousand poor patients seen by him, during the ten years in which he was attached to the dispensary; and the result of almost every case is stated: but these formed, I believe, but a small part of the number of poor for whom he prescribed. I have known him see, and prescribe for, more than 80 patients in one morning; and in the month of January, 1824, when he was only beginning to be known, he saw 100 new cases at his own house, for none of which he received any remuneration: within five months from that time, he had prescribed for more than 700. The number became greater in the next year. Mentioning this to me in one of his communications, he says, "you may well suppose I cannot permit loquacity." Of the cases of many he kept full notes, and he never lost an opportunity of examining the results of diseases in cases terminating fatally, keeping well-arranged records of such circumstances. For a time, he transmitted quarterly reports of the diseases of Birmingham to Dr. Duncan, of Edinburgh, and they appeared in the Edinburgh Medical and Surgical Journal. His private practice increased very slowly. His merit was of that kind which only time and peculiar oppor-

tunities could disclose; and his seniors and competitors were among the most distinguished provincial physicians of England. But, during this probationary period, his sense of duty caused him to pay as much attention to the minutest points of practice, in attending his poor patients, as if his fortune had depended upon it. Among other things, he felt a most laudable anxiety to secure them from the carelessness which he too often witnessed, with respect to the manner of performing vaccination; and, commenting on the indifference he sometimes observed to prevail on this subject, he expresses himself, in a letter now by me, very strongly concerning those who "practice medicine as a lucrative art merely, and seem to have no feeling that it is a science which they are bound conscientiously to understand and exercise; that neither rank nor station ought to influence them where attention is necessary, and that in affecting to administer to the maladies of those who are not affluent enough to remunerate them, they are committing a base and felonious deception."

A friend and neighbour, who knew him most intimately, a surgeon of the highest respectability, who had daily opportunities of seeing him for many successive years, and whose friendly offices only ceased when all human attention became in vain, has so well described his habits and character as a practitioner, in a letter with which he has favoured me, that it would be unjust to Dr. Darwall's memory not to quote his own words. Mr. Wickenden will, I know, require no apology for my doing what is dictated by such a wish, respecting one whom he

regarded with sentiments of friendship not second to my own. "It would ill become me," says Mr. Wickenden, "to obtrude an opinion on the general or professional education of our late friend; but, perhaps, I may be excused a few remarks upon his conduct as a practitioner of the art, and as a progressive student in the science of medicine. On this subject I need not inform you that his views were most comprehensive; that he cultivated with extraordinary zeal, and recommended with great earnestness for diligent study, every branch of learning and science upon which the professional student could climb; deeply impressed with the conviction that upon every twig are to be found 'leaves for healing.' In the examination of patients, his enquiries were minute, and he availed himself of every means that he could acquire to correct or increase the power of the inlets to his mind. Thus, although he possessed no very superior sense of hearing or touch, by diligent attention he attained peculiar tact in distinguishing the various changes produced by disease in the chest and its contained organs, by means of the stethoscope and percussion. His botanical pursuits led him, likewise, to cultivate the use of the microscope, the wonderful power of which he delighted to develope, in the illustration of animal as well as vegetable structures. His mode of treating disease was cautious, but as far removed from timidity on the one hand, as from temerity on the other. Pathological investigation he held to be of primary importance, and it consequently obtained a large share of his attention: for this pursuit such was his

ardour, that he made extraordinary sacrifices of personal comfort in its prosecution."

He was so rigidly punctual in the daily exercise of the duties of his profession, that it was almost impossible to persuade him to leave home even for part of a day. Yet the wish to be better acquainted with some of the practitioners of the Metropolis, and some interest felt in the success of a medical association which was then contemplated, led him, with myself, to pay a visit, of nearly a week, to London, in the latter part of 1824; and the journey now forms an interesting fragment of my recollections of him.

The business of the projected association (the plan of which never became fully organized) caused us to pass an evening at Dr. Birkbeck's house, in the company of that eminent person, and many of his medical friends. Those who have witnessed, as it has since often been my privilege to do, the intellectual reunions at the house of that truly philosophical physician, will know that there is a charm about them which it would be vain to attempt to describe. My friend Dr. Darwall was animated and happy: and our conversation was of medicine; and of Edinburgh days; and of those medical reforms which, then almost hopeless, seem, at length, to have forced their way to general consideration.

One well-remembered day, also, we passed with Mr. Abernethy; experiencing, from that remarkable man, all the kindness which he vouchsafed to all who visited him as friends; and delighted, as we could not fail to be, by the variety, the force, the vivacity, and the elegance of his conversation. In the hurry

of many engagements, we also found time to visit libraries and collections of a scientific description; some public buildings, the courts of law, and the theatres: and I now discovered how warm an interest my friend took in all public matters; and that, amongst his other reading, he had become very intimate with the masters of the English drama. The mention of these particulars may require some apology; but, in my recollections, they are preserved, as illustrative of a mind which was not only never idle, but never ill employed. To pass a day with Dr. Darwall, was to discover how much might be done in a day; what active duties gone through; what objects of interest attended to; and what subjects of animating and improving discourse suggested, in communion with an elevated and energetic intellect. It happened that, on our return, we travelled alone; and if, when recurring to the reminiscences of our discourse in that pleasant journey, I feel a pleasure in reflecting that, of the many worthy designs he contemplated, some he lived to accomplish; this pleasure is saddened by the reflection that, in less than ten years, all his manly aspirations were hushed in the repose of the levelling grave.

He was, at the period of which I am now speaking, and he remained as long as he lived, one of the few persons, engaged in the active affairs of the world, with whom his friends might, at any time, communicate on the highest or most serious subjects. He never met such subjects with indifference, or turned from them with levity. The charm of this consistency can be best estimated by those who have seen, with regret, in numerous instances, the gradual

vanishing of many of the fresher and better feelings in men's progress through life; and how often the acquired faults of selfishness come to be cherished, as if they were proofs of wisdom increased, and experience turned to profitable uses. From his youth upwards he had been carefully instructed in religion; and, when not excited by any reference to political considerations, his views were as worthy of the philosopher as of the christian. He seemed always persuaded that life was given to men for good ends: and in all the years in which I knew him, and in all the circumstances in which I saw him, I never knew him idle, or frivolously occupied; or rendered, either by fatigue or care, unwilling to enter upon any subject connected with the advancement of knowledge or the interests of virtue.

We had, for several months before this time, been projecting the establishment of a new Medical Review; and one of the results of this journey was an engagement to assist Dr. Copland in editing the London Medical Repository, of which a number appeared on the first of every month. This kind of labour, than which nothing can be more irksome to men of middle age, is particularly attractive to younger writers, and we entered on our task with much enthusiasm. It requires a bold man, Montesquieu says, to make a reviewer; for he must make up his mind to make a hundred enemies a month. Like other reviewers, we sometimes found it difficult to speak the truth without offending the sensitiveness of authors: we were sometimes threatened, and sometimes flattered, in the hope that we would be partial or unjust; but, during the two years in which

we continued our labours, whatever might be the qualities of our works, I can, at least, say that they were performed in the strictest spirit of independence. We endeavoured, especially, to call attention to the numerous valuable medical books then appearing in France and Germany; and, also, to the still more neglected older medical writers of the profession. Dr. Darwall furnished articles on the theories of Stahl and Hoffmann; on the medical doctrines of Broussais; on the diseases of infants; and on the causes of sudden death: he wrote retrospective reviews of the Chirurgia parva Laufranci, and of Sir John Floyer's Pulse-watch: he also reviewed Dr. Baron's Life of Dr. Jenner, in a manner strongly indicative of his estimation of that erudite and admirable performance. In the course of nearly two years, it is unnecessary to say that he contributed numerous other articles, which it is not necessary here to particularize. For some time he wrote monthly reports on prevalent diseases: a subject to which he seems always to have directed his attention. It was about this time that Dr. Copland and Dr. Darwall wished that a medical dictionary should be undertaken; and, I believe, this design was chiefly impeded by my own scepticism as to the possible achievment of a task so laborious, by any three physicians. Dr. Copland has since shewn that his own learning and unassisted industry were sufficient for such an undertaking; and accident caused both Dr. Darwall and myself to become contributors to the more extensive Cyclopœdia.

The business of the Repository afforded me abundant opportunities of seeing Dr. Darwall's character

in every light, and proved to me, what, indeed, I entertained no previous doubts concerning, his love of every kind of learning, his acuteness and candour as a critic, his high sense of honour, his unwearied assiduity, and his entire freedom from the meanness and selfishness, the development of which poisons almost every association of men, for whatever purposes. I never remember our entertaining different opinions on any subject connected with the conduct of the Journal. We divided the task of reading the Foreign Journals, and, during its performance, Dr. Darwall made himself well acquainted with the German language, "hating," as he expressed it, "to take things at second-hand." I may add, that if we had no great reason to estimate its pecuniary advantages highly, we felt that the exertion which our editorship imposed upon us, and the necessity of being alert and punctual, and attentive to passing events in our profession, was a most valuable remuneration: and such will these habits be found by all who, undertaking the management of the medical press in a good spirit, preserve their minds from the littleness and from the rancour which, without some vigilance, such an occupation certainly has a tendency to cast over the character. About the middle of the year 1827, Dr. Darwall's practice was increasing so much as to make him less desirous of continuing the occupation of a public writer, and we resigned the care of the Repository into the hands of Dr. Gordon Smith, who, although then in the prime of life, is now, also, numbered among the dead.

The portion of Dr. Darwall's life of which I have now treated, was one in which his hopes were yet

undiminished, and his cares were not so accumulated as heavily to oppress him; yet, either from constant over-exertion, or a constitutional disposition to melancholy, or that consciousness, already alluded to, of possessing few popular qualities to set off his merit, his letters often bespoke a most deplorable depression of mind. Writing to me in June, 1825, of something he designed to do for the Repository, he adds, "I am not a little glad to be obliged to do this work, for, at times, I am so depressed, that I almost could retire altogether, and 'shut the book and lay me down and die.' I have objects around me, it is true, for whose welfare I am anxious, and, to a certain degree, I have progressed in the lucrative part of my profession: but greater success has not brought greater happiness, and I often look upon the past with sorrow, and upon the future without hope." Yet this was written at a time when Dr. Darwall was in the fullest activity of his mind; and, communicating his thoughts to me on the subject of several undertakings proposed between us, in which he exhibited, at once, great ardour, and singular prudence and judgment. His letters, though generally written with haste, and never studied, were then, and always, full of information; and there are many portions of them which I should feel a pleasure in publishing, if I did not entertain as strong a dislike, as I know he himself felt, to any thing approaching to a violation of epistolary confidence. It was my custom, and that of several of his friends, to consult him on many and different subjects, and to refer to him the details of obscure cases met with in practice. In his replies

to such applications, his sagacity and his candour were always very conspicuous.

Excepting a visit to Gloucester, of which I find the recorded results in an account, in one of his note-books, of the lunatic asylum and hospital of that city, and in a letter, in which he describes to me the pleasure he had experienced from having an opportunity of seeing and conversing with Dr. Baron, the distinguished biographer of Dr. Jenner, I believe he seldom left home, even for one day, during the nine years which he lived, after our visit to London. The history of any one day, during all this period, would be almost the history of his life. He rose early, often wrote or studied before breakfast, saw his patients with the utmost regularity, and had, generally, gone through what, to many, would have appeared a day's occupation, before eleven o'clock, the hour when, of late years, he visited the hospital. The interruptions of a physician's life, in a large town, are almost incessant; and, knowing, as I do, how much of this he had to suffer, I can only express surprise when I consider the number of engagements which he voluntarily incurred, and the accuracy with which he found time to arrange his thoughts on a great variety of professional and of general subjects. During all these years, his case-books shew a continual attention to every thing which occurred in his practice; and, besides several small volumes filled with notes of single cases, he had, on some particular subjects, collected so many as to form the ground-work of essays, or of larger works which he meditated, and which, if longer life had been accorded to him, he would have completed.

To the Midland Medical and Surgical Reporter, of which, for a time, he was joint-editor with Dr. Hastings, he contributed papers on the medical statistics of Birmingham; on spinal and cerebral irritation; some cases of ovarian or encysted dropsy; observations on general dropsy; some cases of a peculiar species of paralysis; a case of diabetes insipidus; and some clinical observations. At the request of the publisher of Beck's valuable work on Medical Jurisprudence, he undertook to be the editor of a new edition of that work, which he enriched with some highly-instructive notes, often the result of his own observation. This was a subject which he had long taken every occasion of improving his mind upon; and, as the task of editing the work was first offered to myself, I knew that I should do the medical public a service by pointing him out as much better fitted for it.

His collections on the subject of dropsy were very numerous, and the result of many years' observation; although the substance of them appears to have been almost wholly condensed into the articles on the different forms of dropsy in the Cyclopædia of Practical Medicine. These articles, I may venture to say, possess much practical value: they are the products of experience and study, on the part of an author whose information was very extensive, and whose observation was singularly exact. After examining his very numerous case-books, it appears to me that most of the results which he had found time to deduce, as established by the instances therein with so much diligence preserved, were published, during his life-time, in the papers above

mentioned; or in his admirable little book entitled Plain Instructions for the Management of Infants, with Practical Observations on the Disorders incident to Children; published in 1830;* or in the observations appended to that work, on Several Forms of Spinal and Cerebral Irritation; or in the article on the Diseases of Artisans, in the Cyclopædia. Valuable cases, undoubtedly, occur, of almost every description, in his unpublished records, but, probably, only such as might be found in the case-books of most physicians of extensive practice. His remarks on bronchitis and phthisis, intended as the ground-work of a contribution to these Transactions, on the Curability of Phthisis, may, perhaps, be prepared to appear, although in an imperfect shape, in the next volume; and this may possibly be followed by some other selections.

The contemplation of the numerous practical memoranda accumulated by so industrious and able a physician, papers never, perhaps, after such inspection as I can afford time to give them, to occupy the careful regard of any human eye, suggests a melancholy commentary on the years of ardent exertion in which they were compiled, and on the faithful observations thus appearing to have been made, with great pains, only to be, when made, neglected. When it is considered, too, how many records of a similar kind must, at the death of each observant practitioner, share the same fate; how many designs are left unfinished; how many valuable thoughts pursued a little way

* By Whittaker & Co. London, and Beilby, Knott, & Co. Birmingham.

and lost; we see a strong additional recommendation thus afforded, of every kind of meeting and society of medical practitioners, either local, or, as in this great Association, more general, by which the isolated knowledge of many minds may be concentrated, proved by multiplied comparisons, and so classified as to advance the science of medicine more rapidly. To me, who knew Dr. Darwall so intimately, every line of his practical writings comes with the strong conviction of their strict truth and invariable candour. His senses were so accurate, his imagination was so restrained, his memory so retentive, and his judgment so calm and admirable, that he was secured from the very common fault of being self-deceived by defective medical evidence; whilst his integrity made it impossible for him to attempt the deception of others. His disposition was so abhorrent to quackery, even the most indirect, and such as many men think compatible with respectability of character, that he even disdained to give to his opinions and his knowledge all the advantages of expression of which they were worthy; but he never published an opinion without being thoroughly satisfied of its truth, and the opinions published by him will seldom or never be found to be erroneous. Equal to his intense contempt for quacks and pretenders, and publishers of specious falsehoods, was his respect for all those writers of our own time by whom medicine has been improved. To possess their works, to know or to correspond with the authors, to make them his friends, and to do justice to their merits, were among the few pleasures for which he ever appeared to be anxious.

In one of his letters, written ten years before his death, after speaking of his anxiety for more practice, he tells me that he has had a very friendly letter from a distinguished medical writer, and that it "enabled him to live quietly for a week without fees." In fact, his whole life was spent in making himself acquainted with what others had done, and in emulating their example.

Among the manuscripts left in so incomplete a state that their publication would seem to be an injustice to the deceased, and yet which are not unworthy of him, I find several lectures on physiology, to some of which the mere list of authors appended, as having been referred to, shews the labour he had bestowed on this duty:—the commencement of a treatise on asphyxia; some papers containing facts and observations, many made by himself, on the general subjects of health and disease; an excellent but unfinished essay on vaccination, a subject in which he took a very lively interest; some further cases and observations connected with the subject of sudden deaths without apparent cause; notes which appear to be the heads of lectures on medicine, which he, perhaps, contemplated at some future time: remarks on a dissection of the brain, by Dr. Spurzheim, witnessed by him in 1828; notes on medical reform; short analyses of Cuvier, Shaw, and other writers on different branches of Natural History; notes on the history of printing, and on the progress of literature; the notes on printing having, probably, been made on the occasion of his delivering a lecture on that subject at Stratford, at my request, to the members of a tradesman's library,

some years ago; notes on the early dramatists of England. These shew the activity of his mind, of which, however, as well as of his perseverance, his dispensary and hospital case-books are the principal monuments. His private case-book is continued to the day before his last illness; and his manuscript notes of morbid anatomy terminate with a note of the case, the examination of which proved fatal to him, made on his return from the hospital, when he had no suspicion that he had that day imbibed the seeds of death, and that, after that day, he would never resume his active labours more.

About seven years before his death, he began to pay great attention to the science of botany, and, with his characteristic energy, collected numerous plants, consulted every author within his reach, provided himself with one of Dollond's microscopes, and devoted himself to the pursuit with as much ardour as if it had been his chief occupation. *This* was, in fact, his relaxation. He subsequently gave a course of lectures on the subject, to the medical students at Birmingham, of which the introductory lecture is published in the 8th number of the Midland Medical and Surgical Reporter. He found time, also, to make himself very accurately acquainted with the past revolutions of medical science, and wrote a history of medicine for the Society of Useful Knowledge, which will, in a short time, be published.

In the progress or the origin of several of the public institutions of Birmingham, he took an active share, often encountering opposition, but generally overcoming it. He laboured, soon after his appoint-

ment to the dispensary, to render that institution more widely serviceable to the poor of the town. The general and the medical libraries were always objects of his solicitude; of the latter he was one of the founders, and, of the founders, one of the most zealous. To his enthusiasm, combined with his perseverance, it is, I believe, in no small degree, to be attributed, that the inhabitants of Birmingham can now boast of a botanic garden, which promises to be among the finest in this kingdom: the interest he took in the general objects, and, even, in the minutest details of this undertaking, was of the strongest kind, and the last walk in which he indulged, was in those gardens, in company with a very zealous co-operator, his friend, Mr. Knott. Some years before his death, he was appointed one of the governors of the grammar-school, an office which extremely gratified him, and in which, as was usual with him, he earnestly strove to be useful; actively superintending the extensive alterations in the buildings, attending the meetings of the building committee, and feeling much anxiety concerning the adoption of such plans as might reflect honour on his native town, and diffuse instruction among the children of his fellow-townsmen. He gave some lectures, during one winter, at the rooms of the Philosophical Society; and, in short, endeavoured to contribute something to every useful establishment in the community of which he was a member. Except on a few occasions, he maintained, I think, some scruples concerning taking an active part in public meetings; but he, occasionally, attended the meetings of the Society for promoting Christian

Knowledge, and, on some occasions, spoke. On one of these occasions, he gave the following valuable testimony respecting the benefits of popular education: it was a meeting at which the bishop of the diocese presided. "In looking, my lord, to this resolution," he says, "I perceive it has particular claims upon us; for one of its objects is to afford instruction to those immediately around us. In so large a population as this, there must always be much vice and much crime; but there is a much larger proportion of that which is the origin of vice and crime, I mean, of ignorance. I rejoice, my lord, that I live in times when so much activity is displayed in spreading information of every kind. I rejoice that even the poorest of my neighbours may become more acquainted than formerly with the intricacies of science; for I am sure that science is not unfavourable to religion, and I feel confident that, in those who are most accomplished in science, we shall find the warmest and ablest defenders of religion. But, though I know that there is in science nothing incompatible with religion, it is most true that it is a great good or a great evil, just as it may be directed. It is our part to take care, that no effort which we can make shall be spared to direct it aright."

Dr. Darwall was appointed physician to the Birmingham Hospital in 1831, after the lamented death of Dr. De Lys, a physician held in the highest estimation, and who died of phthisis, at an age which might have promised him many more years of life and activity. Of this appointment Dr. Darwall had always been extremely ambitious, and, indeed, if by

any accident he had not obtained it on this melancholy vacancy occurring, the disappointment would, assuredly, have very deeply affected him. But he had now passed eleven years at Birmingham, as a physician; his character was highly respected; and the confidence of the profession, and of the public, in his professional skill, was daily increasing. His friends were so numerous that, when the day of election came, the other candidates had withdrawn, and in a manner not a little gratifying to him. He had always been very sensible of the difficulty with which a physician, not attached to an hospital, can do much to improve medical knowledge, or even gain useful experience; and he was not insensible to the advantages which the appointment would reflect on his private practice, which, from this time, rapidly increased. The governors of the hospital never had a medical officer more desirous of efficiently performing his duties; and he shewed the interest he took in the advancement of the pupils, by immediately instituting clinical lectures; thus adding to his own labours, at a period when his time was daily becoming more valuable to him. His patience in investigating a disease was only exceeded by his perspicacity in detecting it, and his anxiety to cure it. He was of opinion (for the subject was often entertained by us) that the therapeutic part of medicine, and the distinction of diseases by symptoms, had, of late years, been too much neglected by many who were most sanguine in their views of the value of morbid anatomy; and whilst he never omitted an opportunity of enlarging his knowledge of the products of disease, his first anxiety always

was, as that of every practitioner should surely be, to discover them during life, and to prevent or to remedy them. His continual care, added to his excellent abilities, and great professional learning, made him, in my estimation, a physician whose opinion was almost unerringly correct, and whose practice comprehended whatever was prudent and rational in the whole range of medical science, domestic or foreign, modern or ancient. His knowledge, in every department of his profession, was so full and so exact, that no one ever sought his opinion who went away unsatisfied. That these valuable qualities and acquirements were freely and extensively exercised, for the poor as well as the rich, is testified by the respect and affection with which his name is yet mentioned in every part of the populous town in which he lived: and that he always freely imparted his views to those who wished to be acquainted with them, many friends can bear testimony.

Among the medical men of his own neighbourhood, few held so honourable a rank. Many who, for a time, misunderstood or feared him, had learned to respect him by the casual introductions occurring in practice. He was resorted to in every difficulty; and the general practitioner felt that, with him, not only the patient, but the reputation of the medical adviser who had been previously employed, was secure. In all the common affairs of life, or occurring between medical men, he was often consulted by those only a few years younger than himself, like one whom long experience had made sage: and no perplexities of circumstances, no temptations to give pleasing but delusive counsel, ever led his upright

mind astray from the principles of the most delicate honour.

Of the medical profession and character he took high and correct views; and although he distrusted, as well he might do, the common hands by which plans of reform were most likely to be moulded, he regretted the singular blindness of the highest association of physicians in England, to what their position might be, and to what it was. As was the case with Dr. Thackeray,* he was not a Licentiate of the College of Physicians; and he thus added one more distinguished name to the many which would have reflected honour on the College, if, instead of an imbecile anxiety to preserve useless privileges, that College had exhibited an enlarged ambition, and sought to collect, within its walls, the learning and science and worth possessed by the great portion of the profession whom its constitution repelled; and who would have given it new strength now in the day of its need. His views of reform, as connected with the College, were such as appear to me to be entertained by all respectable provincial physicians: he did not seek to destroy, or to deface, but to liberalize, improve, and preserve an ancient institution. The day for so doing is, perhaps, gone by. The storm, which has so long been gathering, is at hand; and they who despised its early indications must abide its force.

Dr. Darwall always felt it to be a great advantage to reside in a town possessing so many intelligent and highly-educated men as were to be found in so large and important a place as Birmingham; and

* See vol. I. of the Transactions.

no meetings were so agreeable to him as those which were held by them in connection with the business of the Medical Benevolent Society of Birmingham, of which he was a very zealous member; or of the Medical Library, in the institution of which he had taken a very great interest. Among his numerous memoranda, are notes of the subjects of conversations in a society in which he frequently met with some of his most accomplished medical friends; including some curious circumstances illustrative of the effects of imagination on the fœtus; and of feigned defects or diseases. These are but insignificant instances of his continual mental activity; but to me, looking over his unfinished manuscripts, even such instances appear characteristic of one who never allowed an opportunity of acquiring knowledge to pass unprofited by, and who was daily increasing his information,—

"And hiving wisdom with each studious year."

The result of all was, that to every requisite in the character of an accomplished practitioner, Dr. Darwall united extensive learning, a large acquaintance with modern literature, and no small knowledge of several branches of science; for, in truth, there was no subject which had ever occupied the human understanding, on which he could be said to be quite uninformed, whilst with many he was very fully acquainted. His great general attainments, and his professional proficiency, were owing, doubtless, in the first place, to extraordinary mental capacity; and, in the second, to his never having allowed his time to be encroached upon by what less ambitious men consider pleasurable engagements. He was

very indifferent to society, except the society of accomplished persons; and, of late years, he shunned every public amusement. As his youth had been passed without irregularity, so his maturer years were passed with uniform and strict propriety. He was fastidious as to the society of females, indifferent to music, he never played cards, and conviviality had no charms for him. As too often happens with studious men, he was, to a certain degree, insensible to the pleasures even of domestic life, although always to be found at home, and always evincing an extreme anxiety concerning the education of his daughters, and every prospective circumstance connected with the happiness of the objects of his tenderest affection. Of his affectionate attachment to his wife and children, to his parents, his sisters, and his brothers, several memorials, connected with many painful incidents, now remain, to which it is unnecessary to give publicity. His letters to myself on the occasion of the death of some of his relatives, breathe a tenderness of disposition to which he seldom permitted himself to give expression.

I would willingly close this account of him without alluding to his cares, his difficulties, and those honourable anxieties which had too surely prepared him to fall under any severe attack of illness. Although for the last two or three years of his life his practice had greatly increased, he had endured, for full ten years, all the restlessness of hope deferred; and, carefully maintaining his proper station in society, and scrupulously correct in all his payments, had found it necessary to incur extensive pecuniary engagements. There exists no reason, that I am

aware of, for concealing that this circumstance preyed so heavily on his mind as to seem gradually to occupy his thoughts more and more exclusively. He knew the uncertainties of existence, and his constant hope was to live to be extricated from embarrassment, that his family might be benefited by a considerable insurance effected on his life. But man ever disquieteth himself in vain. The hopes which animated his mind were destined never to be fulfilled; the fears which made him sleepless were destined never to leave him until he became insensible to all impressions; and, although, after his decease, a just and generous public made his family its own especial care, such was the independence of his character, that, if he could have foreseen that *that* was to be the end of all his struggles, the prospect would have broken his heart.

This painful part of the history of Dr. Darwall, painful to be read, painful to write, has been but too much the general history of young physicians. Occupied in the task of relieving human sufferings, encountering fatigue and danger, and with few of the rewards of ambitious life before them, often stimulated solely by the desire of doing good, they are too frequently a prey to cares and pains, far worse than those from which they are exerting themselves to relieve others: and whilst they carry comfort and hope into every sick chamber, feel those blessings still denied to themselves. From no store-house of illustration may the pathologist gather ampler materials of the effect of the depressing passions, than from his own profession. He may there perceive, in instances too many, how perpetual care

may interrupt each healthy function, and induce disorders which no medical art can cure. Highly educated, sensitive, accustomed to some of the elegancies of life, their habits not well fitting them for worldly competitions, how many have I known who have suffered every pang which common difficulties could inflict on noble minds, and, after suffering for a time, have sunk; or, if surviving their difficulties, have done so with feelings irretrievably deadened, and a sadness of heart which no improvement of fortune could effectually remove! There is something wrong in their position when such examples are not infrequent; and as there are few physicians who, having conquered their difficulties, could endure the bare idea of going through the struggle again, it becomes a serious question how far any members of the profession are justified, if not possessed of an ample fortune, in devoting themselves to a branch of practice which holds out no promise of a competency until two-thirds of the usual term of human life have been passed in anxiety. My friend felt this anxiety so greatly, it was so often the subject of his conversation, that, although it cannot now be said to have been excessive in relation to its causes, I sometimes thought it my duty to remonstrate with him on the indulgence of a feeling which did not seem entirely consistent with the trust in Providence to be expected from a man of such sincere piety, and which was evidently doing injury to his habitual thoughts and feelings. I have repeatedly represented to him the sure foundation on which that public esteem which he could not but see gathering round him, was founded; that it was

honestly gained and would wear well; and that there was a certain prospect for him of an almost immediate practice, so large as to free him, in a few years, from every difficulty. Man's wordly wisdom is as vain as his disquietude. All these expectations, which I was fully justified in representing to him, and which he, at times, indulged in with reasonable hope, were frustrated at once. Just as the prospect about him was clearing, and years of reputation and of independence, or, even, of wealth, seemed to be opening upon him, a slight accident, acting upon a frame rendered very irritable and feeble by mental restlessness, extinguished his life almost without any effort or appearance of resistance in his constitution.

This memoir, however imperfect, will be perused by many who, having known something of Dr. Darwall, will be interested in anything that recalls his name. It will, also, be looked into by some who, perhaps, acquainted with my deceased friend, and with myself, may feel some kind of curiosity to learn in what manner I have touched on certain points connected with the opinions held by Dr. Darwall on the important subjects of religion and politics: opinions which had so constant an influence on his conduct, and were so conspicuously proclaimed on many occasions, as not to be passed over in silence. On this subject, which I approach with some reluctance, but which cannot be wholly avoided, I shall express myself with truth and freedom, but without exaggeration. The office of the biographer is not to render the praise of the dead worthless by making it indiscriminate, nor yet to conciliate the favour of the living by disingenuous concealments;

but to instruct by the examples which he describes. All who knew Dr. Darwall, knew that he was most zealously attached to the Church of England. Of that church his father, his grandfather, and his great grandfather, had been ministers, and his ancestors steady adherents.* The manner in which he sometimes avowed this attachment, was certainly such as to raise a suspicion in the minds of those little acquainted with him, that his religion was merely the religion of *party*, or that political religion which an acute foreign writer has severely observed to be almost the only religion known in England.

Although no imputation could be more unjust, I will not affect a surprise which I do not feel, that it should have been attached to him. Of those most clamorous, in this country, for allying the church with temporal power, although some are distinguished by that habitual charity which arises from a frequent communion with their Maker, the proofs of whose mercy they delight to contemplate, there are unfortunately, many whose chief enjoyment seems to be to represent that Maker merely as a being of anger, and terror, and revenge. Take from them the hatred of their neighbours, and the privilege of "dealing damnation" on all who differ from them, and all that they called their religion has left them. With them, a readiness to raise a party cry is a symbol of orthodoxy, and justifies the most inde-

* The father of Dr. Darwall's great grandfather was a country gentleman, and resided in Cheshire; his son, the clergyman, is one of those "reverend and learned" men whom Nicholls mentions, in his Literary Remains, as having had personal disputes with the then rising sect of Methodists.

cent neglect of the true interests of the church. If Dr. Darwall sometimes appeared to countenance such vulgar bigotry, he could not escape imputations alike unjust and degrading. But no member of the church less deserved to be numbered with the mob of the bitter and the intolerant: and if he, occasionally, appeared more to favour them than beseemed a man of his acquirements and understanding, this fault was more than atoned for by the sincerity and the fervour of his own piety, and by his irreproachable life No day ever passed without his thoughts being turned to a subject which he always considered to be, and always spoke of, as of the first importance. He had read, with much attention, the works of most of the great divines whose learning and whose virtue reflected honour on the church of which he professed himself a member; and had, if I may so speak, imbibed, from the perusal, an habitual devotion, but without a tinge of fanaticism. Few general readers were so conversant with the writings of Barrow, of South, of Hooker, of Horne, and of him the most attractive, perhaps, of all, the imaginative and pious Jeremy Taylor; whose works, the reflection of his truly Christian spirit, alluring many readers by splendid images and words of captivating eloquence, have sometimes made religious thoughts familiar to minds which would have turned away from religion invested with monkish gloom, or leaning for support on mere temporal authority.

Dr. Darwall was a punctual attendant on the services of the church; and no one better knew or more undisguisedly deplored the coldness, the indifference,

and the worldliness, which he saw to pervade those services, and all the evils which he beheld them bringing in their train: he frequently inveighed against the neglect of the study of divinity in those intended for the church; nor did any member of the church more honour the bright exceptions to these faults, existing in some of his most intimate and most valued clerical friends.* He marked the close of every year, in the books in which he kept an account of the fees he had received in the course of it, by a Latin prayer; and these affecting compositions, which I have been permitted to see since his death, contain the sentiments of a pure and grateful heart, relying on the Creator in all that befell him, submissive in trial, and thankful for benefits and support.

On the less serious subject of his political opinions, I shall say little. I have long wondered to see men and neighbours divided into hostile parties, seeking, with eagerness, to destroy the fame of those whose opinions on the best form of government differ from their own; forgetting, it would seem, the possibility of two persons, with equally honest intentions, forming very different judgments, on a subject concerning which men are only beginning to discern any

* It may here, perhaps, be permitted to me to mention the intimacy subsisting between my late friend and the Rev. Mr. Hook, of Coventry, for whom he entertained the highest respect; and, also, to introduce the name of the Rev. Mr. Moore, of Alrevas, near Lichfield, to whom Dr. Darwall had been known from his youth, and whom he greatly regarded. It might wound the delicacy of these truly excellent clergymen if I were to say more on this subject: but their esteem for Dr. Darwall has been most affectionately evinced since his death; and, on the other hand, Dr. Darwall was never more animated than when dwelling on the support given by the talents and example of such men to the Church which he wished to prosper.

correct principles. The explanation of all this rancour is, perhaps, to be sought for in the interested motives with which political opinions of every cast are usually taken up and maintained. Dr. Darwall was uninfluenced by any such motives; he was a warm and disinterested patriot; but, at the same time, as may be supposed from what has already been said, a zealous Tory; and such being the party he espoused, it was in his character to become one of the most open and fearless assertors of sentiments which, to persons of a different way of thinking, appeared to betray some indifference to the happiness of mankind. His benevolence, I doubt not, would have prevented him, if he had possessed the power, from acting entirely up to the opinions he avowed: but his benevolence was more dependent on the uprightness of his mind, and his sense of duty, than on warmth of feeling. The frequent spectacle of popular processions in such a town as Birmingham; perhaps an unpleasant personal experience of such assemblies; a strong distrust of many popular leaders; a constitutional apprehension of whatever threatened to interrupt the order of society; gradually ripened what had at first been little more than an attachment to the principles of a party in which he had many friends, into a zeal for every form of power, wherever exercised against the people, and a want of sympathy with any nations in which the people strove to throw off a tyranny, however intolerable. It was not that he took any delight in the sufferings of mankind, but he doubted their being emancipated from them by the struggles which others viewed with enthusiasm. In such

doubts many men, of all parties, may consistently concur; but it was painful to me to see how, even in so well exercised a mind as that of Dr. Darwall, these habits of thinking, not calmly indulged, led, by almost imperceptible degrees, to the renunciation of any cheering belief in the progressive improvement of well-governed communities, and to melancholy doubts whether arts, letters, free forms of government, and popular education, ever had conduced, or ever would add, to the positive happiness of mankind. The unhappy tendency of these views was, latterly, very observable in Dr. Darwall's letters and conversation; his reflections on what he thought the impending fate of his country filled him with dejection and distress; insomuch that, for the last year or two of his life, he saw the propriety of diverting his thoughts from politics; and, even, discontinued his attendance at the news-room, that he might not read the newspapers. There were few subjects, on which we differed, in which I was not inclined to respect his opinions more than my own: and on these great subjects of religion and of politics, if I cannot deny that he was open to the charge of intolerance, I may, with solemn truth, aver that he was most sincere in his own belief. And, indeed, when I recollect some memorable occasions on which I have seen him in the society of those who totally differed from him in religious faith, and, above all, when I recollect our unbroken friendship, which his dying hour only terminated, I feel that I am almost guilty of harshness in admitting that to be intolerance which, principally observable in his animated discourse, imparted no asperity to

his conduct, led him into no act of injustice, and left the sanctuary of his heart undefiled.

If my departed friend is conscious of these words, he knows that they are written with a sacred regard to that truth which he now beholds more nearly and clearly; and by one whose affection for his memory forbids the possibility of any intentional misrepresentation.*

* I cannot refrain from quoting a passage here, which occurs in one of his numerous letters to me, and which, besides the lively account it contains of the preaching of a celebrated dissenter, is, in other respects, very characteristic of Dr. Darwall's epistolary style.—"Within the last two or three days, amidst several other books, I have had Sir Thomas Browne's works given me, containing, among other things, his Enquiry into Vulgar Errors, and Religio Medici. I do not wonder that the latter should have been very popular. There is an easiness of style about it, with such an extraordinary fertility of ideas, as perfectly astonishes me. The more I become acquainted with the authors of that day, the more do I feel my opinion of the men of the present age humbled. Why is it that whatever was done then so abounded in rich illustration, powerful statement, striking antithesis, exuberant power of language, to which we seem such utter strangers? Have we less industry or less genius; or are the minds of the highly-gifted amongst us turned into other sources; or is it that we have only a few, and those the very best writers of the age, who were popular in their own day. Be it as it may, the press labours, and the paper mills scarcely suffice to supply the daily and nightly scribblers, and yet not one, whom I know, can be compared to the giants that flourished in those days. After this, you will be hardly prepared for anything like praise of a cotemporary, and yet I shall be hardy enough to venture on it. On Sunday last *(this was in September,* 1824*)* I heard Robert Hall, of Leicester; and I really was astonished at the man. I do not know if you have heard him or not. If not, suppose to yourself a man of common appearance, and weak voice, and yet, merely by the powers of his mind, commanding the undivided attention of his congregation. Not to have heard such a man, is, in my feeling, a loss in the path of life. He is as superior to Irving as manly intellect to brute force; as the mind of the author, to the mountebankism of the actor; as the lofty and towering oak, to the shadow that it casts upon the ground. I was disappointed in the commencement; but, in the course of his sermon, there were such

I have now but to record the events of his last illness, so accidental in its origin, so rapid in its progress, so fatal in its end.

It has already been said that Dr. Darwall's health had been impaired by his anxieties. To this cause must be added his incessant exertions. He seemed almost incapable of repose. To do nothing, or to be delayed, or to be long in one place, or to be compelled to make sacrifices of time to society, seemed to become more and more intolerable to him. His mind was for ever at work. Relaxation, lounging unemployed, idle conversation or diversions, convivial pleasures, everything of that kind seemed unnecessary or tormenting to him. His desire to be acquainted with every able publication of the day, either professional or literary, or relating to any science, filled up most of the intervals of his busily employed time. It was very rare to find that others had read a book of which he knew nothing: he even read many books of mere amusement, and he sometimes regretted the tendency of the present age to efface too rapidly the imaginative pleasures of the young by a premature introduction to physical science, which he thought less useful to them than such nursery tales as illustrated "right and generous feelings." Latterly, however, if he read works of amusement, it was with eager haste, and in such a sort as if he scorned himself that could be pleased

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bursts of real chaste eloquence, as have not fallen to my lot to hear. He preaches, you know, extempore; and yet he never was in want of a word. He began without hesitation, and he continued gathering vehemence and energy as he proceeded, till he was completely wrapt in his subject; yet never departed from even a logical arrangement."

with such productions. His correspondence was extensive, but when he wrote a letter, he soon quitted light subjects, and detailed the more important thoughts with which his labouring breast was filled. His mind was never vacant, or in a state to be pleased or even amused with trifles. The labour which he voluntarily underwent every day, was, in reality, too much for his physical powers. At one time he tried to rouse his jaded faculties by wine, although the most temperate of men, and one whom wine never elated; then abandoning the use of wine entirely, or nearly so, he had recourse to coffee, of which he would sometimes partake immoderately. Thus he persevered in a determination to do, by some means or other, a certain quantity of work, for which natural strength was denied him; and no exhortations of his friends, no persuasions, could produce in his mind any conviction of the important fact, that to do what he was determined to do, could not be done with health preserved, and that what he needed, far more than any stimulants, was some rest, some cessation from toil, some tranquil time in which the composure and the strength of his nervous system might be, to a certain extent, regained. But he felt and expressed this conviction to me when it was quite too late to profit by it.

In fact, he had struggled against his warning feelings for years. He remarked, in the last conversation he was capable of holding with me, only six days before his death, that if he had taken some rest and relaxation two years before, he should not have been brought into the debilitated state in which he found himself. But even nine years before, he

felt the misery of energies overtasked; and wrote to me of himself, with prophetic truth, that he was "almost one of those wretched beings whom Lord Byron describes,

> 'Their breath is agitation, and their life
> 'A storm whereon they ride, to sink at last.'"

He was then harrassed by business of various descriptions, connected with his property; he was laboriously occupied, and with little profit; and for many a year, or even to the last, his mind was not only continually employed, but even irritated, and almost continually over-exerted.

This being his habitual state, it was not to be wondered at that the function of digestion should become imperfectly performed; that he should experience irregularities of the circulation, sometimes painfully affecting his head, and sometimes disturbing the action of the heart. On one or two occasions, he suffered severe attacks of a description of cholera; although not at the time when the disease was prevalent in England. His nights were frequently very restless; and in his tumultuous sleep he was subject to convulsive actions of different voluntary muscles; never, however, so severe or general as to constitute a paroxysm. The trouble of his bodily health reacted upon his mind: he became more impatient, more anxious, more desponding of his prospects, or more sensible of the difficulties with which he had to struggle, even when his prospects were rapidly improving. Clear and bright, amidst all this trouble, the light of his intellect continued to shine, undiminished by care, and unimpaired by bodily languor. Nothing which

was in progress in medical knowledge escaped him; and his interest in the public undertakings to which he had given his time or his attention suffered no abatement. Yet his state, amidst this unwearied activity, was such as to occasion me, who saw him but occasionally, some misgivings as to his long continuing to enjoy life; whilst on those who saw him daily, the impression it produced was such that, when he incurred the accident now to be mentioned, they at once despaired of his recovery.

In his Hospital Book, bearing the date of July 30, 1833, the last note made by my lamented friend is found, relating to the examination of a body that day in the hospital. The note is headed Medullary Sarcoma of the Bronchial Glands; and it is observed that the subject of the case had been a patient of Dr. Booth. "The left lung was infiltrated with pus, and the left pleura was inflamed, as was, also, the pericardium; there was a very large quantity of serum in this pleura, and the pericardium was very much distended with a dark coffee-coloured fluid. The bronchial glands of this side were very much enlarged, and changed, for the most part, into a white medullary mass, which involved the left primary division of the bronchi; and though the wrinkled state of the lining membrane enabled us to trace its passage, the colour was lost, as, also, was most of the cartilaginous substance. A part of this medullary mass was quite soft, and almost fluid, and in another part it had a pinkish hue. There were, also, some fibrous white bands traceable."

These, I believe, were the last words ever written by Dr. Darwall, and they conclude by a date of the

day on which he wrote them, a particular he often omitted, but the accidental insertion of which makes it impossible for a friend to view this last record of his indefatigable observation without emotion. On that day Dr. Darwall dined early, and afterwards accompanied Mr. Knott, who had dined with him, to the botanic garden, in which they both took, as has already been remarked, a very active interest. He drank tea late, with his friend and relative Mr. Whateley, who left him in his usual health. He sat an hour in his dressing-room, reading a botanical work which happened to lie on the table, and, on going to bed, fell into a comfortable sleep. He had, indeed, retired after a day of considerable exertion, with unusual feelings of comfort and health. But he was never to know them again. About two in the morning he awoke, feeling very cold; and so violent a fit of shivering ensued, that, being alone, in consequence of his family being then at Malvern, he rang up his servant to make him some coffee, which was always his favourite restorative. He found, on making the attempt to get out of bed, that to do so required a great degree of effort. After taking some coffee, he began to suffer from intense heat, accompanied with severe burning pain in the head. It was now between three and four o'clock in the morning, and his friends Dr. Male and Mr. Wickenden were summoned to see him. Notwithstanding the great sense of heat which he suffered from, he complained of being *chilly* all over him, the term being employed, perhaps, to express an indescribable sensation accompanying the heat; he seemed, also, to be suffering great distress, without

adequate cause: his countenance had an anxious expression; the skin was hot; the pulse small, rapid and weak; the tongue dry, and the stomach disturbed. He had, for some time, been occasionally troubled with patches of psoriasis on his left hand, and in this hand he had observed that he had sharp pain in the morning of the preceding day, at the dissection. Before going to bed, he had applied nitrate of silver to some patches of this kind, which he had been in the habit of doing when the patches felt uncomfortably. When Mr. Wickenden was examining the patches, Dr. Darwall complained of uneasy sensations in the arm, and a small gland in the axilla was found to be hot, painful on pressure, and hard. It now, for the first time, occurred to him, that the occurrences in the dissecting room might have some connection with his present state of disturbance.

The nature of the disorder became sufficiently clear to suggest the immediate recall of Mrs. Darwall and his daughters, from Malvern. By Mrs. Darwall's kindness I was, in a day or two, made acquainted with these unexpected and unwelcome circumstances. I shall hurry over the melancholy sequel. Little expecting how these symptoms would terminate, I only saw him occasionally during his short illness. Dr. John Johnstone, Dr. Male, Mr. Hodgson, and Mr. Wickenden, watched him with the utmost care, and for several days entertained pretty confident hopes of his recovery; or, at least, Mr. Wickenden's intimate knowledge of Dr. Darwall's peculiar constitution, led him alone to doubt

it.* When I visited my friend, two days after his attack, and again in two days more, there was little, to ordinary observation, calculated to alarm. He was more than usually restless, and very anxious speedily to be well: he slept ill; his pulse was frequent, and there was an evident febrile state, but far from intense: and his muscular strength was much less than his energy of will. He had severe pains, now and then, in his shoulders and back. The secretions from the kidneys exhibited the most marked departure from health, being scanty, and very dark. His mind was extremely active, and his disposition to talk required restraint. Once or twice, after being ill four days, he misplaced his words in speaking. He not unfrequently spoke of medical subjects, and with his usual judgment and good sense; and he was cheerful, and entertained no apprehension of worse consequences than he had already incurred. When I saw him two days after that, it was disheartening to find that the restlessness, the agitation, the quick pulse, still remained: his mind had become a little affected: he had convinced himself that his pains were rheumatic, and of the kind described by Fothergill, whose description he wished to have read to him. Other symptoms, not calculated to encourage those about him, had come on; but none which were of a nature to deprive them of hope. Engagements, which could not be postponed,

* Among the consolations of this afflicting time, none was more gratefully felt than the kind sympathy evinced by the medical friends of Dr. Darwall resident in Birmingham. Their solicitude during his illness, and their noble generosity, after the event was determined by death, are things reflecting honour on a profession of which liberality and benevolence are the brightest and the most habitual ornaments.

obliged me, on that day, to go to London ; and when I saw him, four days afterward, (on the 10th of August) he was dying. I now reflect, with surprise, that I was so unprepared to find him so : but there is an unwillingness, it would seem, in the mind, to associate the idea of death with that of activity and life in those to whom we are attached, and whom we have only known as the participators of all life's active engagements. He was quite sensible ; and I had the melancholy gratification of seeing him recognise me, and rouse himself to make an effort to speak to me in his customary tone of kind enquiry.

Medical men are not strangers to the scenes of bereavement which are presented by families overtaken by such sudden and hopeless calamities ; and to the sacred sorrows of those who loved him I shall attempt to give no expression. But far beyond the limits of that house of mourning was felt the sorrow which Dr. Darwall's death occasioned. His friends, and the whole medical profession, felt that a most valuable member of society had been taken from them : his neighbours, and the inhabitants of Birmingham in general, strongly expressed the concern this unexpected loss had occasioned them ; and among the poor many tears were shed, by those who had lost one of their kindest friends, and many a humble but heartfelt prayer was offered up, to that heaven in which such prayers find acceptance, for his eternal welfare.

In accordance with wishes very generally expressed, his funeral was a public one ; and on the 16th of August his mortal remains were deposited in the family vault at Christ Church. Every phy-

sician and surgeon of the hospital and of the dispensary; almost all the lecturers and pupils of the medical school of Birmingham; many of the practitioners from surrounding towns, and a great number of the principal inhabitants, followed the procession, through crowded and silent streets, to the grave. The funeral service of the church, which none can hear at any time quite unaffected, was read with impressive solemnity by the Rev. Mr. Hook, whose well-known regard for him for whom he performed that last office of friendship, added to its deep effect on this most sad occasion.

When a mind so remarkable for its well-directed activity as that which animated the frame of him of whom I have traced these mournful recollections, is thus suddenly extinguished in the insensibility of death, and all the hopes it had conceived are lost, and all the cares, and alike the aspirations, of which it was conscious, have ended in results so unfinished, like the fragments of some broken design; the first unavoidable impression, made by such an instance, is, that it constitutes a bitter and disheartening commentary on the ardour, the industry, the self-denial of early years; and even on the virtuous exertions of manhood. Left, we know not why, to act a few years longer in a scene from which one whom we loved has, all at once, disappeared, we look around for some explanation; and, finding none, exclaim that man is altogether vanity. Failing to comprehend a destiny so incomplete and inscrutable, we anxiously desire some assurance, stronger than our trust, that the moral improvement of those departed,

and their ministry in the moral creation, may yet be continued, although in another sphere ; with objects clearer, and with hopes enlarged. Perplexed with such feelings, there is no relief for us except in unqualified resignation to the will of Him by whose permission the soul, which he has so soon recalled, was permitted to fulfil what, to our blindness, appears an incomplete sphere of earthly duty. All proud attempts to account for God's doings end in dissatisfaction : our hopes are baffled by the ignorance with which our life is encompassed ; and our affections find no solace but in the everlasting truth that the power on which we all depend, is associated with perfect wisdom and unfailing goodness. It is not (as was said of old, and has oftentimes been repeated) ours to say what part we shall take, or when it shall end ; but to perform our part well, whatever it may be, and howsoever it may close.

Lamenting, as his friends cannot but lament, the untimely death of Dr. Darwall, they may still reflect that length of days, and wealth, and honours, could have added but little to the just reputation which it was his happiness to have gained in early life ; and that, although he died young, the regret of grateful citizens, and the esteem of all who knew him, were gathered round his tomb.

END OF VOL. II.

INDEX

TO

VOLUME FIRST.

A

PAGE.

Address, delivered at the first Meeting of the Association, ... 4
Aneurism of the basilar artery, ... 270

B

Barlow, Dr. Edward, on the objects and modes of medical investigation, ... 29
———— biographical memoir of Dr. Thackeray, ... 419

C

Cantharides, case of suspected poisoning by, ... 402
Coley, James Milman, on imperforate hymen, ... 68
Conolly, Dr. John, proposal to establish County Natural History Societies, ... 180

D

Dawson, James, history of a case of spina bifida in the adult, ... 219
Disease, state of, in Worcester, in 1832, ... 359
Diseases of infants and children, on the peculiarities of, ... 73

E

Eye, diseases of, report of Birmingham Infirmary of, ... 340

F

Frontal sinus, theory of, ... 59

H

Hastings, Dr. Charles, inaugural address, ... 4
———— case of suspected poisoning by cantharides, 402
Heart, some cases illustrative of diseases of, ... 123
Hernia, strangulated, cases of, ... 141
Hetling, William, case of osteo-sarcoma of both jaws, ... 277
Humerus, on dislocation of, ... 275
Hydrocephalus, case of, ... 173
Hymen, case of imperforate, ... 68

I

PAGE.

Infirmary, Birmingham, report of out-cases of, ... 353
Influence, reciprocal, of the mind and body in health and disease, 109

J

James, J. H., observations on strangulated hernia, ... 141
Jeffreys, Dr. Thomas, cases illustrative of diseases of the heart, 123
Jennings, A. Egerton, case of aneurism of the basilar artery, ... 270

M

Malden, Dr. Jonas, on the reciprocal influence of the mind and body in health and disease, ... 109
Medical Investigation, on the modes and objects of, ... 29
Melanosis, case of, ... 244
Middlemore, Richard, report of the Birmingham Infirmary for diseases of the eye, ... 340
Milligan, Dr. E., theory of the frontal sinus, ... 59

N

Natural History Societies, proposal to establish, ... 180

O

Osteo-sarcoma, a case of, in both jaws, ... 277

P

Parsons, George, report of out-cases in the Birmingham Infirmary, 353

S

Scott, Dr. Roger Wakefield, on the necessity, the utility, and precursory symptoms of sleep, ... 258
Sleep, on the necessity, the utility, &c. of, ... 258
Spina bifida in the adult, ... 219
Streeten, Dr. Robert I. N., report of state of Disease in Worcester, in 1832, ... 359

T

Thackeray, Dr. Joseph, biographical memoir of, ... 419
Toogood Jonathan, on dislocations of the humerus, ... 275
Traill, Dr. Thomas Stewart, case of hydrocephalus, ... 173

W

Walker, Dr. J. K., on the peculiarities of diseases in infants and children, ... 73
Williams, Dr. David, case of melanosis, ... 244

INDEX

TO

VOLUME SECOND.

A

PAGE.

Address, delivered at the first anniversary meeting, ... 1

B

Bardsley, Dr. James Lomax, on strychnia in paralysis, ... 200
Barlow, Dr. Edward, anniversary address by, ... 1
Brown, Dr. J., on the variations in the prevalence of certain diseases, ... 329

C

Carrick, Dr. Andrew, on the medical topography of Bristol, ... 148
Cholera, on, as it appeared at Wolverhampton and neighbourhood, 368
Conolly, Dr. John, biographical memoir of *Dr. Darwall,* 489

D

Davis, Thomas, case of a foreign body found in the heart of a boy, 357
Darwall, Dr. John, biographical memoir of, ... 489
Dawson, James, case of lithotomy by the rectum, ... 301
Diseases of infants and children, on the peculiarities of, ... 391
Diseases, on the variations in the prevalence of, ... 329

E

Eye Infirmary, Birmingham, report of diseases of, ... 457

F

Forbes, Dr. John, sketch of the medical topography of the Landsend, ... 32

G

Green, Thomas, on the treatment of syphilis without mercury, 241
Grindrod, Ralph Barnes, case of hydrophobia, ... 311

H

Heart, case of a foreign body found in, ... 357
Hydatids, uterine, case of, ... 349
Hydrophobia, case of, ... 311

I

Infirmary, Birmingham, report of the out-cases of the, ... 474
Inflammation, chronic-peritoneal, on the treatment of, ... 268

J

PAGE.

Jennings, Egerton A., on the changes produced in the lungs by artificial inflation and by natural respiration, ... 435

K

Kidney, case of tuberculous affection of, ... 340

L

Lithotomy, case of, by the rectum, ... 301
Lungs, on the changes produced by artificial inflation and natural inspiration, ... 435

M

Middlemore, Richard, report of Birmingham Infirmary for diseases of the eye, for 1833, ... 457
Morgan, William F., on dislocations of the shoulder, ... 361

P

Parsons, George, report of the out-cases at the Birmingham Infirmary, for 1833, ... 474
Prichard, John, case of tuberculous affection of the right kidney, with extensive disease of the spinal column, ... 340

R

Rat, (Cuba,) on the anatomical structure of the liver of, ... 364
Riley, Dr. Henry, on the above, ... ibid

S

Scott, Dr. Roger Wakefield, on the influence of sleep on the vital functions, ... 423
Shoulder, on dislocation of, ... 361
Sleep, its influence on the vital functions, ... 423
Strychnia, on the efficacy of, in paralysis, ... 200
Syphilis, on the treatment of, without mercury, ... 241
Symonds, Dr. John Addington, on the medical topography of Bristol, ... 148

T

Thompson, Edward, on chronic-peritoneal inflammation, ... 268
Topography, medical, of Bristol, ... 148
——————— of the Landsend, ... 32
——————— of Stourport, ... 181

W

Walker, Dr. J. K., on the peculiarities of diseases of infants and children, ... 391
Ward, Dr. Ogier, on cholera at Wolverhampton, ... 368
Watson, Kenrick, medical topography of Stourport, ... 181
Watson, William Daniell, case of uterine hydatids, ... 349

In consequence of some of the Articles in this volume having extended to a greater length than was anticipated, the Council are under the necessity of deferring the publication of the Communications of several Members, until the first part of the third volume appears, which will be published with as little delay as possible.

A communication has been received from Dr. Nieuwenhuys, of Amsterdam, one of the Foreign Corresponding Members of the Association.

ERRATA.

Page 48, line 15, *for* possesses *read* possessing.
— 64, — 24, — tryphylla — triphylla.
— 107, — 19, *dele* per.
— 220, — 2, — wholly.

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PART I. CONTAINS

Abdomen, Exploration of	*By Dr. Forbes.*	Alteratives	*By Dr. Conolly.*
Abortion	*Dr. Lee.*	Amaurosis	*Dr. Jacob.*
Abscess	*Dr. Tweedie.*	Amenorrhœa	*Dr. Locock.*
Abstinence	*Dr. M. Hall.*	Anæmia	*Dr. M. Hall.*
Achor	*Dr. Todd.*	Anasarca	*Dr. Darwall.*
Acne	*Dr Todd.*	Angina Pectoris	*Dr. Forbes.*
Acupuncture	*Dr. Elliotson.*	Anodynes	*Dr. Whiting.*
Age	*Dr. Roget.*	Anthelmintics	*Dr. A.T.Thomson.*
Air, Change of	*Dr. Clark.*	AntiphlogisticRegimen	*Dr. Barlow.*
Alopecia	*Dr. Todd.*	Antispasmodics	*Dr. A.T.Thomson.*
		Aorta, Aneurism of	*Dr. Hope.*

PART II. CONTAINS

Aphonia	*By Dr. Robertson.*	Ascites	*By Dr. Darwall.*
Aphthæ	*Dr. Robertson.*	Asphyxia	*Dr. Roget.*
Apoplexy, (Cerebral)	*Dr. Clutterbuck.*	Asthma	*Dr. Forbes.*
Apoplexy,(Pulmonary)	*Dr. Townsend.*	Astringents	*Dr. A.T.Thomson.*
Arteritis	*Dr. Hope.*	Atrophy	*Dr. Townsend.*
Artisans, Diseases of	*Dr. Darwall.*	Auscultation	*Dr. Forbes.*

PART III. CONTAINS

Barbiers	*By Dr. Scott.*	Brain, Inflammation of the	*By Dr. Quain* / *Dr. Ad.Crawford.*
Bathing	*Dr. Forbes.*	Bronchitis	*Dr. Williams.*
Beriberi	*Dr. Scott.*	Bronchocele	*Dr. And. Crawford.*
Blood, Morbid States of	*Dr. Marshall Hall.*	Bullæ	*Dr. Todd.*
Bloodletting	*Dr. Marshall Hall.*	Calculus	*Dr. Thos. Thomson.*

PART IV. CONTAINS

Calculous Diseases	*By Dr. Cumin.*	Cold	*By Dr. Whiting.*
Catalepsy	*Dr. Joy.*	Colic	*Dr. Whiting.* / *Dr. Tweedie.*
Catarrh	*Dr. Williams.*	Colica Pictonum	*Dr. Whiting.*
Cathartics	*Dr. A.T. Thomson.*	Coma	*Dr. Ad. Crawford.*
Chest, Exploration of	*Dr. Forbes.*	Combustion, Spontaneous Human	*Dr. Apjohn.*
Chicken-Pox	*Dr. Gregory.*	Congestion of Blood	*Dr. Barlow.*
Chlorosis	*Dr. M. Hall.*	Contagion	*Dr. Brown.*
Cholera	*Dr. Brown.*	Convalescence	*Dr. Tweedie.*
Chorea	*Dr. And. Crawford*		
Climate	*Dr. Clarke.*		

PART V. CONTAINS

Convulsions	*By Dr. Adair Crawford.*	Delirium Tremens	*Dr. Carter.*
Convulsions, Infantile	*Dr. Locock.*	Dentition, Disorders of	*Dr. Joy.*
Convulsions, Puerperal	*Dr. Locock.*	Derivation	*Dr. Stokes.*
Coryza	*Dr. Williams.*	Determination of Blood	*Dr. Barlow.*
Counter-Irritation	*Dr. Williams.*	Diabetes	*Dr. Bardsley.*
Croup	*Dr. Cheyne.*	Diaphoretics	*Dr. A. T. Thomson.*
Cyanosis	*Dr. Crampton.*	Diarrhœa	*Dr. Crampton. Dr. Forbes.*
Cystitis	*Dr. Cumin.*		
Delirium	*Dr. Prichard.*	Dietetics	*Dr. Paris.*

PART VI. CONTAINS

Dilatation of the Heart	*By Dr. Hope.*	Dyspnœa	*By Dr. Williams.*
Discase	*Dr. Conolly.*	Dysuria	*Dr. Cumin.*
Disinfection	*Dr. Brown.*	Ecthyma	*Dr. Todd.*
Diuretics	*Dr. A. T. Thomson.*	Eczema	*Dr. Joy.*
Dropsy	*Dr. Darwall.*	Education, Physical	*Dr. Barlow.*
Dysentery	*Dr. Brown.*	Electricity	*Dr. Apjohn.*
Dysmenorrhœa	*Dr. Locock.*	Elephantiasis Arabum	*Dr. Scott.*
Dysphagia	*Dr. Stokes.*	Elephantiasis Græcorum	*Dr. Joy.*

PART VII. CONTAINS

Emetics	*By Dr. A. T. Thomson.*	Epilepsy	*By Dr. Cheyne.*
Emmenagogues	*Dr. A. T. Thomson.*	Epistaxis	*Dr. Kerr.*
Emphysema	*Dr. Townsend.*	Erethismus Mercurialis	*Dr. Burder.*
Emphysema of the Lungs	*Dr. Townsend.*	Erysipelas	*Dr. Tweedie.*
Empyema	*Dr. Townsend.*	Erythema	*Dr. Joy.*
Endemic Diseases	*Dr. Hancock.*	Exanthemata	*Dr. Tweedie.*
Enteritis	*Dr. Stokes.*	Expectorants	*Dr. A. T. Thomson.*
Ephelis	*Dr. Todd.*	Expectoration	*Dr. Williams.*
Epidemics	*Dr. Hancock.*		

PART VIII. CONTAINS

Favus	*By Dr. A. T. Thomson.*	Fever, Intermittent	*By Dr. Brown.*
Feigned Diseases	*Dr. Scott, Dr. Forbes, Dr. Marshall.*	Fever, Remittent	*Dr. Brown.*
		Fever, Infantile Remittent	*Dr. Joy.*
Fever, Continued	*Dr. Tweedie.*	Fever, Hectic	*Dr. Brown.*
Fever, Epidemic Gastric	*Dr. Cheyne.*	Fever, Puerperal	*Dr. Lee.*

PART IX. CONTAINS

Fever, Yellow	*By Dr. Gillkrest.*	Gastro-enteritis	*By Dr. Stokes.*
Fungus Hæmatodes	*Dr. Kerr.*	Glossitis	*Dr. Kerr.*
Galvanism	*Dr. Apjohn.*	Glottis, Spasm of the	*Dr. Joy.*
Gastritis	*Dr. Stokes.*	Gout	*Dr. Barlow.*
Gastrodynia	*Dr. Barlow.*	Headach	*Dr. Burder.*

PART X. CONTAINS

Heart, Diseases of the	*By Dr. Hope.*	Hereditary Transmission of Disease	*By Dr. Brown.*
Heart, Displacement of the	*Dr. Townsend.*	Herpes	*Dr. A. T. Thomson.*
		Hiccup	*Dr. Ash.*
Heart, Fatty and Greasy Degenerations of the	*Dr. Hope.*	Hooping-cough	*Dr. Johnson.*
		Hydatids	*Dr. Kerr.*
Hematemesis	*Dr. Goldie.*	Hydrocephalus	*Dr. Joy.*
Hemoptysis	*Dr. Law.*	Hydropericardium	*Dr. Darwall.*
Hemorrhage	*Dr. Watson.*	Hydrophobia	*Dr. Bardsley.*

PART XI. CONTAINS

Hydrothorax	*By Dr. Darwall.*	Identity	*By Dr. Montgomery.*
Hypertrophy	*Dr. Townsend.*	Impetigo	*Dr. A. T. Thomson.*
Hypertrophy of the Heart	*Dr Hope.*	Impotence	*Dr. Beatty.*
		Incontinence of Urine	*Dr. Cumin.*
Hypochondriasis	*Dr. Prichard.*	Incubus	*Dr. Williams.*
Hysteria	*Dr. Conolly.*	Indigestion	*Dr. Todd.*
Ichthyosis	*Dr. A. T. Thomson.*		

PART XII. CONTAINS

Induration	*By Dr. Carswell.*	Inflammation	*By Dr. Adair Crawford. Dr. Tweedie.*
Infanticide	*Dr. Arrowsmith.*		
Infection	*Dr. Brown.*		

PART XIII. CONTAINS

Influenza ....*By Dr. Brown.*
Insanity .... *Dr. Prichard.*
Irritation .....*By Dr. C. J. B. Williams.*
Ischuria Renalis .... *Dr. Carter.*

PART XIV. CONTAINS

Jaundice .....*By Dr. Burder.*
Kidneys, Diseases of *Dr. Carter.*
Lactation ..... *Dr. Locock.*
Laryngitis ..... *Dr. Cheyne.*
Lepra..... *Dr. Houghton.*
Leucorrhœa ..... *Dr. Locock.*
Lichen ..... *Dr. Houghton.*
Liver, Inflammation of, *Dr. Stokes.*
Malaria and Miasma . *Dr. Brown.*
Malformation of the Heart .....*By Dr. Williams.*
Medicine, Practical, Principles of..... *Dr. Conolly.*
Melæna ..... *Dr. Goldie.*
Melanosis ..... *Dr. Carswell.*
Menorrhagia..... *Dr. Locock.*
Menstruation ..... *Dr. Locock.*

PART XV. CONTAINS

Miliaria.....*By Dr. Tweedie.*
Mortification..... *Dr. Carswell.*
Narcotics ..... *Dr. A. T. Thomson.*
Nephralgia & Nephritis *Dr. H. W. Carter.*
Neuralgia ..... *Dr. Elliotson.*
Noli me tangere, or Lupus ..... *Dr. Houghton.*
Nyctalopia ..... *Dr. Grant.*
Obesity .....*By Dr. Williams.*
Œdema ..... *Dr. Darwall.*
Ophthalmia ..... *Dr. Jacob.*
Otalgia and Otitis .. *Dr. Burne.*
Ovaria, Diseases of.. *Dr. Lee.*
Palpitation ..... *Dr. Hope.*
Pancreas, Diseases of *Dr. Carter.*
Paralysis ..... *Dr. R. B. Todd.*

PART XVI. CONTAINS

Parotitis .....*By Dr. Kerr.*
Pellagra ..... *Dr. Kerr.*
Pemphigus ..... *Dr. Corrigan.*
Perforation of Viscera *Dr. Carswell.*
Pericarditis and Carditis ..... *Dr. Hope.*
Peritonitis ..... *By Dr. Mac Adam. Dr. Stokes.*
Persons found Dead.. *Dr. Beatty.*
Phlegmasia Dolens .. *Dr. Lee.*
Pityriasis ..... *Dr. Cumin.*
Plague ..... *Dr. Brown.*
Plethora ..... *Dr. Barlow.*

PART XVII. CONTAINS

Pleurisy .....*By Dr. Law.*
Plica Polonica..... *Dr. Corrigan.*
Pneumonia ..... *Dr. Williams.*
Pneumothorax .....*By Dr. Houghton.*
Pregnancy and Delivery, Signs of .... *Dr. Montgomery.*

PART XVIII. CONTAINS

Prognosis .....*By Dr. Ash.*
Pseudo-Morbid Appearances ..... *Dr. R. B. Todd.*
Psoriasis ..... *Dr. Cumin.*
Puerperal Diseases.. *Dr. M. Hall.*
Pulse..... *Dr. Bostock.*
Purpura..... *Dr. Goldie.*
Pus.....*By Dr. Tweedie.*
Pyrosis ..... *Dr. Kerr.*
Rape ..... *Dr. Beattie.*
Refrigerants ..... *Dr. A. T. Thomson.*
Rheumatism ..... *Dr. Barlow.*
Rickets ..... *Dr. Cumin.*
Roseola ..... *Dr. Tweedie.*

PART XIX. CONTAINS

Rubeola.....*By Dr. Montgomery.*
Rupia..... *Dr. Corrigan.*
Scabies ..... *Dr. Houghton.*
Scarlatina..... *Dr. Tweedie.*
Scirrhus..... *Dr. Carswell.*
Scorbutus .....*By Dr. Kerr.*
Scrofula..... *Dr. Cumin.*
Sedatives ..... *Dr. A. T. Thomson.*
Sex doubtful..... *Dr. Beatty.*
Small Pox..... *Dr. Gregory.*

PART XX. CONTAINS

Softening of Organs..*By Dr. Carswell.*
Somnambulism and Animal Magnetism. *Dr. Prichard.*
Soundness and Unsoundness of Mind . *Dr. Prichard.*
Spleen, Diseases of the *Dr. Bigsby.*
Statistics, Medical .. *Dr. Hawkins.*
Stethoscope ..... *Dr. Williams.*
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Succession of Inheritance—Legitimacy . *Dr. Montgomery.*
Suppuration ..... *Dr. Todd.*
Survivorship..... *Dr. Beatty.*
Sycosis ..... *Dr. Cumin.*
Symptomatology .... *Dr. M. Hall.*

PART XXI. CONTAINS

Syncope .....*By Dr. Ash.*
Tabes Mesenterica .. *Dr. Joy.*
Temperament ..... *Dr. Prichard.*
Throat, Diseases of the *Dr. Tweedie.*
Toxicology .....*By Dr. Apjohn.*
Transformations .... *Dr. Duesbury.*
Transfusion ..... *Dr. Kay.*
Tubercle ..... *Dr. Carswell.*

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Worcester, May 22nd, 1834.

WORCESTER:
Printed by Chalk and Holl, Herald-Office.